Feasibility study for an economic evaluation of the prevention measures in the field of HIV and other sexually transmitted diseases (STI): Final report

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Feasibility study for an economic evaluation of the prevention measures in the field of HIV and other sexually transmitted diseases (STI)

Final report

Commissioned by the Federal Office of Public Health (FOPH)

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and Daniel Kübler

Zurich, Mai 2013

Contract number:	12.003445 / 704.0001 / -544
Contract period:	August 2012 – Mai 2013
Data collection period:	August 2012 – March 2013
FOPH evaluation project manager:	Christine Heuer, Evaluation and Research Unit (E+F)
Meta-Evaluation:	This report was commissioned by the FOPH to be prepared externally in order to obtain an independent and scientifically sound answer to key questions. The interpretation of the results, conclusions and any recommendations to the FOPH and other actors may thus differ from the FOPH's opinion or position. The draft report was the subject of a meta-evaluation by the FOPH's E+F unit. The meta-evaluation (scientific and ethical quality control of an evaluation) is based on the quality standards of the Swiss Evaluation Society (SEVAL standards). The results of the meta-evaluation were given to the evaluation team and taken into account in this report.
Available from:	Evaluation and Research Unit (E+F), Federal Office of Public Health, CH-3003 Bern evaluation@bag.admin.ch www.health-evaluation.admin.ch
Original language:	English
Recommended citation:	Frey, Kathrin, Christopher Goodman, Thomas Widmer and Daniel Kübler (2013): Feasibility study for an economic evaluation of the prevention measures in the field of HIV and other sexually transmitted diseases (STI). Zurich: Department of Political Science, University of Zurich.
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Abstract

Mandate of the feasibility study

The National Programme on HIV and other sexually transmitted infections (STI) 2011-2017 (NPHS) aims to generate better evidence on the efficiency of its prevention measures for decision-making. The Federal Office of Public Health (FOPH) intends to commission an economic evaluation of prevention measures in the field of HIV/STI. This economic evaluation, according to the FOPH, should deal with the following topics:

- The overall cost-benefit-relation of HIV/STI prevention in Switzerland and separately for the three axes of intervention of the NPHS.
- The cost-benefit-relation of the FOPH resources spent for HIV/STI prevention.
- The optimal allocation of prevention measures (resources) among the three axes of intervention of the NPHS.
- The cost-benefit-relation of prevention measures for men having sex with men in Zurich.

Seeking support for the conceptualization of the mandate for such an economic evaluation, the FOPH has commissioned the Department of Political Science of the University of Zurich to conduct a feasibility study.

Objectives of the feasibility study

The feasibility study aims to analyse whether and how an economic evaluation of HIV/STI prevention measures can be conducted. It aims to elaborate a concept for a feasible economic evaluation.

Methods of the feasibility study

In order to define the data requirements for such an economic evaluation, the concept of a chain of effects (intervention logic) of the NPHS 2011-2017 is used. The feasibility study analyses the state of research in this field and assesses the availability of data. Since data on the costs of HIV/STI prevention are largely missing, a pilot study on one selected prevention measure was conducted to generate insights into the feasibility of a cost data collection. Further, the feasibility study includes expert interviews and discussions to assess the relevance and the feasibility of such an economic evaluation in Switzerland. Finally, the feasibility study specifies the mandate for an economic evaluation of prevention measures in the field of HIV/STI.

Findings and recommendations

Generally, economic evaluation is seen as an instrument to generate policy relevant information on the efficient allocation of resources in the field of public health and more narrowly in the field of HIV/STI. However, the majority of the studies reviewed here examined single interventions. We found only two analyses dealing with western countries and covering prevention measures of all three intervention axes of the NPHS. Thus, the approach that covers multiple prevention interventions as envisaged by the FOPH is not (yet) an established approach.

Cost-utility analyses (using quality-adjusted life years QALY) dominate the field and are most frequently conducted from a societal perspective including all costs and consequences of HIV/STI prevention. QALY and “infections prevented” were the most commonly used indicators for measuring the effects of HIV/STI prevention interventions.

The pilot study on the costs of the realisation of a selected measure, “Break the Chain” 2012 in Zurich, showed that a cost data collection is feasible at a reasonable research effort. However, the pilot study required a considerable contribution by the actors of "Break the Chain" 2012. The availability of data on the consequences (outcome/impact) of HIV/STI prevention is fragmentary and rather scarce. Surveillance data is available but it does not cover all relevant target populations. Further, data on other STI than HIV is even more limited.

The expert interviews and discussions reveal that the ambitions of such a study should be lowered. The main concerns relate to the difficulties to conceptualise and measure the effectiveness of HIV/STI prevention. The experts share the opinion that the co-operative approach adopted in the implementation of the NPHS makes it impossible to reliably estimate the contributions of single actors in terms of achieved consequences.

In the light of these findings, we formulate the following general recommendations:

- We recommend dismissing the separate estimation of the efficiency of the resources spent for HIV/STI prevention by the FOPH for reasons of feasibility.
- We recommend not opting for a cost-analysis instead of an economic evaluation of the consequences of the NPHS.
- We recommend that any comparisons of the intervention axes of the NPHS 2011-2017 should acknowledge the different goals of these axes.
- We recommend that any comparisons within the intervention axes should take into account the differences in goals and in the ways of influence of those prevention measures targeting structural conditions and those directly targeting individual behaviours of the end addresses.

In order to specify the mandate of an economic evaluation we propose two alternatives and recommend choosing between them. Alternative A consists in opting for a mathematical modelling study that estimates the efficiency of the NPHS and performs scenario analyses with respect to the mix of prevention measures. In contrast, alternative B opts for a step-by-step approach and proposes to start with very restricted but concrete economic evaluations.

Zusammenfassung

Gegenstand der Machbarkeitsstudie

Das Nationale Programm HIV und andere sexuell übertragbare Infektionen (STI) 2011-2017 (NPHS) ist bestrebt, für die Entscheidungsfindung bessere Evidenz zur Wirtschaftlichkeit seiner Präventionsmassnahmen bereit zu stellen. Vor diesem Hintergrund beabsichtigt das Bundesamt für Gesundheit (BAG) eine ökonomische Evaluation der Präventionsmassnahmen im Bereich HIV/STI in Auftrag zu geben. Gemäss BAG soll diese ökonomische Evaluation folgende Themen abdecken:

- Kosten-Nutzen-Verhältnis der HIV/STI-Präventionsmassnahmen in der Schweiz insgesamt sowie separat für die drei Interventionsachsen des NPHS.
- Kosten-Nutzen-Verhältnis der vom BAG aufgewendeten Ressourcen für die HIV/STI-Prävention.
- Optimale Verteilung der Präventionsmassnahmen (Ressourcen) auf die drei Interventionsachsen des NPHS.
- Kosten-Nutzen-Verhältnis der Zürcher Präventionsmassnahmen für Männer, die Sex mit Männern haben (MSM).

Zur Unterstützung bei der Konzeption des Auftrages (Mandates) für eine solche ökonomische Evaluation hat das BAG das Institut für Politikwissenschaft der Universität Zürich mit der Durchführung einer Machbarkeitsstudie beauftragt.

Zielsetzung der Machbarkeitsstudie

Die Machbarkeitsstudie soll untersuchen, ob und inwiefern eine ökonomische Evaluation von Massnahmen im Bereich der HIV/STI-Prävention durchgeführt werden kann. Sie soll ein Konzept für eine machbare ökonomische Evaluation ausarbeiten.

Methoden der Machbarkeitsstudie

Um die Datenbedürfnisse für eine solche ökonomische Evaluation definieren zu können, wird das Konzept des Wirkungsmodells (Interventionslogik) des NPHS 2011-2017 verwendet. Die Machbarkeitsstudie analysiert den Stand der Forschung auf diesem Gebiet und prüft die Datenverfügbarkeit. Da Daten zu den Kosten der HIV/STI-Prävention weitgehend fehlen, wurde eine Pilotstudie zu einer ausgewählten Präventionsmassnahme durchgeführt. Die Pilotstudie liefert Erkenntnisse zur Machbarkeit von Kostenerhebungen. Die Machbarkeitsstudie umfasst zudem Experteninterviews und -diskussionen zur Relevanz und Machbarkeit einer solchen ökonomischen Evaluation in der Schweiz. Schliesslich konkretisiert die Machbarkeitsstudie das Mandat für eine ökonomische Evaluation von Präventionsmassnahmen im Bereich HIV/STI.

Erkenntnisse und Empfehlungen

Die ökonomische Evaluation wird grundsätzlich als ein Instrument betrachtet, das erlaubt politikrelevante Informationen über die Effizienz des Ressourceneinsatzes im Gesundheitswesen und im engeren Sinne im Bereich HIV/STI zu gewinnen. Die gesichteten Studien untersuchen allerdings meist nur eine einzelne Interventionsmassnahme. Wir fanden nur zwei Studien, die sich mit westlichen Ländern befassen und alle drei Interventionsachsen des

NPHS abdecken. Folglich stellen Analysen, die mehrere Präventionsmassnahmen gemeinsam untersuchen und damit dem Anliegen des BAG entsprechen, (noch) keine etablierte Vorgehensweise dar.

Kosten-Nutzwert-Analysen, die mit dem Konzept der "qualitätsadjustierten Lebensjahren QALY" arbeiten, dominieren die Literatur. Diese Analysen nehmen meistens eine gesellschaftliche Perspektive ein und berücksichtigen alle Kosten und Auswirkungen von HIV/STI-Präventionsmassnahmen. Die am häufigsten verwendeten Indikatoren zur Messung der Wirksamkeit der HIV/STI-Präventionsmassnahmen sind die "QALY" und die "verhinderten Infektionen".

Die Pilotstudie zu den Umsetzungskosten einer ausgewählten Massnahme ("Break the Chain" 2012 in Zürich) zeigt auf, dass eine Kostenerhebung machbar und mit vernünftigem Forschungsaufwand verbunden ist. Allerdings erforderte die Pilotstudie eine beträchtliche Beteiligung der Akteure von "Break the Chain" 2012. Es sind nur wenige und lückenhafte Daten zu den Auswirkungen (Outcome/Impact) der HIV/STI-Prävention vorhanden. Daten zur Überwachung (Surveillance) von HIV/STI liegen vor, erstrecken sich aber nicht auf alle relevanten Zielgruppen. Die Datengrundlagen zu den anderen STI sind noch spärlicher als die Daten im Zusammenhang mit HIV.

Die Experteninterviews und -diskussionen zeigen auf, dass die Zielsetzungen einer solchen Studie herabgesetzt werden sollten. Die grösste Schwierigkeit sei, die Wirksamkeit von HIV/STI-Präventionsmassnahmen zu konzeptualisieren und zu messen. Die Expertinnen und Experten sind sich einig, dass eine zuverlässige Einschätzung des Beitrags einzelner Akteure an der Zielerreichung des NPHS aufgrund der kooperativen Umsetzung des NPHS nicht möglich ist.

Angesichts dieser Erkenntnisse formulieren wir folgende Empfehlungen:

- Aus Gründen der Machbarkeit empfehlen wir, auf eine separate Beurteilung der Wirtschaftlichkeit des Ressourceneinsatzes des BAG für die HIV/STI-Prävention zu verzichten.
- Ebenfalls sollte darauf verzichtet werden, anstelle einer ökonomischen Evaluation der Auswirkungen des NPHS eine Kostenanalyse durchzuführen.
- Wir empfehlen, dass bei Vergleichen zwischen den Interventionsachsen des NPHS 2011-2017 den unterschiedlichen Zielsetzungen dieser Achsen Rechnung getragen wird.
- Bei Vergleichen innerhalb der Interventionsachsen sollte berücksichtigt werden, dass Massnahmen, welche strukturelle Bedingungen im Fokus haben und Massnahmen, die direkt auf die individuellen Verhaltensweisen der Endadressatinnen und -adressaten von Präventionskampagnen abzielen, unterschiedliche Ziele verfolgen und auf unterschiedlichen Wirkungsketten basieren.

Zur Konkretisierung des Mandats für eine ökonomische Evaluation schlagen wir zwei Varianten zur Auswahl vor: Variante A sieht eine mathematische Modellierung zur Schätzung der Wirtschaftlichkeit des NPHS vor und umfasst Szenario-Analysen zum Massnahmenmix. Variante B sieht ein schrittweises Vorgehen vor und empfiehlt, mit eng fokussierten, konkreten ökonomischen Evaluationen zu beginnen.

Résumé

Mandat de l'étude de faisabilité

Le Programme national VIH et autres infections sexuellement transmissibles (IST) 2011–2017 (PNVI) vise à fournir de meilleures données scientifiques sur l'efficience des mesures de prévention qu'il contient en vue des futures décisions à prendre. L'Office fédéral de la santé publique (OFSP) prévoit de mandater une évaluation économique des mesures de prévention dans le domaine VIH/IST, qui porterait sur les thèmes suivants :

- Rapport coûts-bénéfices de l'ensemble de la prévention VIH/IST en Suisse d'une part et de chacun des trois axes d'intervention du PNVI d'autre part.
- Rapport coûts-bénéfices des fonds de l'OFSP dépensés en faveur de la prévention VIH/IST.
- Répartition optimale des mesures de prévention (fonds) entre les trois axes d'intervention du PNVI.
- Rapport coûts-bénéfices des mesures de prévention ciblant les hommes ayant des rapports sexuels avec d'autres hommes à Zurich.

En vue de la définition du mandat d'une telle évaluation économique, l'OFSP a chargé l'Institut de science politique de l'Université de Zurich de réaliser une étude de faisabilité.

Objectifs de l'étude de faisabilité

L'étude de faisabilité vise à déterminer dans quelle mesure il est possible de mener une étude économique des mesures de prévention dans le domaine VIH/IST. Elle a également pour objectif de préciser le concept d'une éventuelle évaluation économique.

Méthodes de l'étude de faisabilité

Afin d'établir quelles données sont nécessaires à une telle étude économique, les mandataires utilisent le concept d'une chaîne d'effets (logique d'intervention) du PNVI 2011-2017. L'étude de faisabilité analyse l'état de la recherche dans ce domaine et examine la disponibilité des données. Comme les données relatives aux coûts de la prévention dans le domaine VIH/IST font largement défaut, une étude pilote a été menée avec une mesure de prévention donnée afin de générer un aperçu de la faisabilité d'une collecte de données. Par ailleurs, l'étude de faisabilité englobe des interviews et des discussions avec des experts afin de déterminer la pertinence et la faisabilité d'une évaluation économique dans ce domaine en Suisse. Enfin, elle précise le mandat d'une évaluation économique des mesures de prévention dans le domaine VIH/IST.

Conclusions et recommandations

De manière générale, les évaluations économiques sont considérées comme un instrument permettant de générer des informations déterminantes pour les décisions politiques en ce qui concerne l'octroi des fonds dans le domaine de la santé publique, et plus précisément dans celui du VIH/IST. Toutefois, la majorité des études menées dans ce domaine portent sur des interventions uniques. Nous n'avons trouvé que deux études traitant des pays occidentaux et englobant des mesures de prévention pour les trois axes d'intervention du PNVI.

Par conséquent, l'approche envisagée par l'OFSP consistant à couvrir plusieurs axes pour les mesures de prévention, n'est pas (encore) une approche établie.

Les analyses coûts-utilité (en utilisant le paramètre « *Quality Adjusted Life Year QALY* »; année de vie ajustée par la qualité) sont très présentes dans ce domaine et sont le plus souvent menées dans une perspective sociétale incluant l'ensemble des coûts et des conséquences de la prévention VIH/IST. Les indicateurs « QALY » et « infections évitées » sont les indicateurs les plus souvent utilisés pour mesurer les effets des mesures de prévention dans le domaine VIH/IST.

L'étude pilote relative aux coûts de la mise en œuvre d'une mesure sélectionnée (« Break the Chain » 2012 à Zurich) a montré qu'il est possible d'obtenir des données moyennant un effort de recherche raisonnable. Toutefois, elle a nécessité une très forte participation de la part des acteurs de « Break the Chain » 2012. Les données sur les conséquences (outcome/ impact) de la prévention dans le domaine VIH/IST sont incomplètes et plutôt rares. Des données de surveillance sont certes disponibles, mais elles ne couvrent pas l'ensemble des groupes cibles. De plus, les données relatives aux IST autres que le VIH sont encore plus rares.

Il ressort des interviews et des discussions avec les experts qu'il faudrait réduire les ambitions concernant une étude économique dans ce domaine. La principale préoccupation mise en avant concerne la difficulté à conceptualiser et à mesurer l'efficacité de la prévention dans le domaine VIH/IST. Les experts sont unanimes sur le fait que l'approche coopérative adoptée lors de la mise en œuvre du PNVI rend impossible une estimation fiable des contributions fournies par les différents acteurs en termes d'objectifs atteints.

A la lumière de ces conclusions, nous émettons les recommandations générales suivantes:

- Pour des raisons de faisabilité, nous recommandons de renoncer à une estimation séparée de l'efficience des fonds dépensés par l'OFSP en faveur de la prévention dans le domaine VIH/IST.
- Nous recommandons de renoncer à une analyse des coûts et de maintenir une étude économique sur les conséquences du PNVI.
- Nous recommandons que toute comparaison entre les axes d'intervention du PNVI 2011-2017 considère les différents objectifs de ces axes.
- Nous recommandons que toute comparaison au sein des axes d'intervention tienne compte des différences d'objectifs et de sphères d'influence entre les mesures de prévention portant sur des conditions structurelles et celles visant directement le comportement individuel des destinataires finaux.

Afin de préciser le mandat d'une évaluation économique, nous proposons deux variantes et recommandons au mandant de choisir entre les deux. La proposition A consiste à opter pour une étude reposant sur un modèle mathématique qui estime l'efficience du PNVI et qui effectue des analyses de scénarios en tenant compte des différentes mesures de prévention. A l'inverse, la proposition B consiste à opter pour une approche pas à pas et propose de commencer par des évaluations économiques très limitées mais concrètes.

Abbreviations

AHS	Swiss Aids Federation (Aids-Hilfe Schweiz)
BTC	Break the Chain
CBA	Cost-benefit analysis (Kosten-Nutzen-Analyse)
CDC	Centers for Disease Control and Prevention
CEA	Cost-effectiveness analysis (Kosten-Wirksamkeit-Analyse)
CUA	Cost-utility analysis (Kosten-Nutzwert-Analyse)
ECDC	European Centre for Disease Prevention and Control
FCSH	Federal Commission for Sexual Health
FOPH	Federal Office of Public Health
FSO	Federal Statistic Office
FSW	Female sex workers
IDU	Injecting drug users
IUMSP	Institut universitaire de médecine sociale et préventive, Lausanne
MSM	Men having sex with men
MSW	Male sex workers
NPHS	National Programme on HIV and other STI
OECD	Organisation for Economic Co-operation and Development
SHCS	Swiss HIV Cohort Study
STI	Sexually transmitted infections
UNAIDS	United Nations Programme on HIV/AIDS
VEGAS	Verband Gaybetriebe Schweiz
WHO	World Health Organisation
ZAH	Zurich Aids Help Organisation (Zürcher Aids Hilfe)

1 Introduction

1.1 Background: The need of the Federal Office of Public Health for an economic evaluation in the field of HIV/STI prevention

The National Programme on HIV and other sexually transmitted infections (STI) (NPHS) 2011-2017 aims to generate better evidence on the efficiency of its prevention measures for decision-making (Federal Office of Public Health, 2010: 114). Several studies stated the lack of evidence on the costs of HIV/STI prevention as well as on the cost-effectiveness of HIV/STI prevention in Switzerland (Dubois-Arber et al. 2012: 14; Erne et al. 2010: 12-15; Frey/Kübler 2011: 12-13; Neuenschwander/Kübler 2006).

The Federal Office of Public Health (FOPH) intends to commission an economic evaluation of prevention measures in the field of HIV and other STI. This economic evaluation, should aim to generate evidence on the following topics:[1]

- The overall cost-benefit-relation of HIV/STI prevention in Switzerland and separately for the three axes of intervention of the NPHS: 1. General population, 2. People with a higher risk of exposure, 3. Infected individuals and their partners.[2]
- The analysis should focus on the FOPH resources spent for HIV/STI prevention separately as well as include all resources (cantonal, communal, public and private) spent on HIV/STI prevention in Switzerland.
- The optimal allocation of prevention measures (resources) among the three axes of intervention of the NPHS.
- The cost-benefit-relation of prevention measures for MSM in Zurich.

Further, the study should be conducted in a societal perspective and take into account that the regions (cantons) of Switzerland are differently affected by HIV and other STI.

Seeking support for the specification of the mandate for this economic evaluation, the FOPH has commissioned the Department of Political Science of the University of Zurich (Prof. Dr. Daniel Kübler) to conduct a feasibility study for such an economic evaluation. This feasibility study was executed in the period from August 2012 to Mai 2013. The present document reports on the results of this feasibility study and outlines recommendations for the definition of a mandate for an economic evaluation on behalf of the FOPH.

1.2 Aim and questions of the feasibility study

The aim of the present feasibility study is to analyse, whether and how an economic evaluation of HIV/STI prevention measures can be conducted. The feasibility study provides the scientific bases for the discussions and decisions concerning the realisation and conceptualisation of an economic evaluation of Swiss HIV/STI prevention measures. On the one hand, the present study aims to contribute to a common understanding of conceptual issues as well

[1] The FOPH has specified these topics in a meeting in June 2012 and defined them in the evaluation requirements (Pfichtenheft) of the present feasibility study.

[2] The NPHS 2011-2017 groups HIV and STI measures into three axes that are directed to specific target populations, namely the general population, the people with a higher risk of exposure and infected individuals and their partners (FOPH 2010: 83). We introduce these axes in section 3.

as to shared expectations on potential findings of an economic evaluation in this field. On the other hand, it aims to elaborate a concept for a feasible economic evaluation.

The feasibility study seeks to answer the following questions:

1. What is the scientific state of the art in this field? How are costs, effects, utilities and benefits conceived? Which indicators and methods are used in economic evaluations of HIV/STI prevention?
2. Which data and data sources are available on the costs (efforts, resources) spent for HIV/STI prevention? Which secondary analyses are possible? Necessity and possibilities of primary data collection?
3. Which data and data sources are available on the effects, utilities and benefits of HIV/STI prevention in Switzerland? Which is the potential of secondary analyses? Necessity and possibilities of primary data collection?
4. What are the implications and challenges for an economic evaluation of HIV/STI prevention in Switzerland?
5. Which HIV/STI prevention interventions should be considered in an economic evaluation (considering that implementation efforts can differ at the local level)?
6. How should a feasible economic evaluation be designed (study design, methods, indicators, data sources)?

1.3 Methods of the feasibility study

We structured the present report into nine sections. Table 1 presents an overview of the questions addressed and methods used in each section.

In the next section 2, we define the core concepts of an economic evaluation that are used thereafter consistently throughout this report. In section 3, we elaborate a chain of effects of the NPHS 2011-2017. Such a chain of effects systematizes and maps the causal framework (intervention logic) of an evaluation object.

In section 4, we analyse the current state of the art. It contains a review of the international literature on economic evaluations of HIV/STI prevention interventions, as well as an analysis of the Swiss literature and the current practice of international organizations (WHO, UNAIDS, OECD, ECDC, CDC), focussing on cost analyses and economic evaluations dealing with health promotion and prevention.

Thereafter, we present the findings on the availability of data, assess the feasibility of secondary data analyses and discuss the requirement of field research (section 5). Section 6 presents the results of a pilot study that was conducted to generate insights into the feasibility of the collection of cost data since such data is largely missing in Switzerland.

Sections 7 and 8 present experts' assessments of the relevance and the feasibility of an economic evaluation in the field of HIV/STI prevention in Switzerland. On the one hand, we discussed the feasibility study with the Surveillance Working Group of the Federal Commission for Sexual Health (FCSH). On the other hand, we conducted five in-depth interviews with health economists.

Finally, the findings of the sections 2 to 8 are synthesised and used to concretise a feasible concept for an economic evaluation in the field of HIV/STI prevention (section 9).

Table 1: Overview on the structure and methods of the feasibility study

Section	Question						Topics	Method / Data sources
	1	2	3	4	5	6		
1							Introduction: Aim, methods, question of the present feasibility study.	
2							Conceptual issues of an economic evaluation of HIV/STI prevention	Qualitative (literature review)
3							Elaboration of the chain of effects of the NPHS 2011-2017	Qualitative (document analysis, literature review) Programme documentation of the NPHS 2011-17.
4							Current practice of relevant international organisations and state of the art in the literature.	Qualitative (document analysis) Quantitative (literature analysis) Websites, databases, the literature analysis on economic evaluation of HIV/STI prevention includes 108 articles.
5							Data availability, necessity and possibilities of secondary data analyses and primary data collection.	Databases such as the Swiss HIV Cohort Study, surveillance data, etc.
6							Pilot study: Collection of data on the prevention costs of Break The Chain (BTC) in Zurich 2012.	Qualitative (document analysis) Quantitative (cost data collection) Documents of BTC, financial data, estimations provided by the involved actors.
7							Assessment by the Surveillance Working Group of the FCSH.	Presentation and discussion with the Surveillance Workings Group.
8							Expert assessment of the relevance and feasibility of an economic evaluation in the field of HIV/STI in Switzerland.	Qualitative (expert interviews) Five guideline based interviews with experts of economic evaluation in the field of public health.
9							Concretisation of a concept for an economic evaluation of HIV/STI prevention	Qualitative (synthesis) Findings of the present feasibility study

Dark cells: Sections provide main results for the respective questions.
More details on the methods and data sources are provided in the respective sections.

2 Conceptual issues of an economic evaluation

An economic evaluation of a prevention measure aims to answer the question "is it worth it?" and thus, compares the costs of the measure (intervention, programme or policy) with its consequences. In other words, an economic evaluation provides information on the efficiency of a prevention measure. It requires data on the input (costs of the measure) as well as on the effectiveness of the respective measure. Economic evaluation is used here as an umbrella term.

In the following we outline the conceptual issues of an economic evaluation in the field of HIV/STI prevention. We introduce the types of analyses, explain how costs and benefits are differentiated in the literature and highlight the perspectives of analysis.

2.1 Types of analyses

In general, the evaluation literature distinguishes in the economic evaluation domain between costs (or productivity) analyses and efficiency analyses (Levin et al. 2001; Widmer/De Rocchi 2012: 52; Drummond et al. 2005: 11; Telser/Zweifel 2000: 4-7). The former concentrates on the analysis of the costs of a measure (or any public goods and services) and often aims at comparing the costs of alternative measures. However, this type of economic information does not provide any insights whether a measure was worth its costs. The latter type of analysis sets the costs of a measure in relation to its consequences (or results). This type of analysis is of particular relevance for the present feasibility study.

The literature on economic evaluation *in the field of public health* usually differentiates between three types of efficiency analyses (Drummond et al. 2005: 11; Gutzwiller et al. 2012: 16-27; Iten et al. 2009: 13-14; Schmiedhauser et al. 2009: 14-15).[3] These types differ in the way they measure the consequences of an intervention (see Table 2). In the present study, the term "consequences of a prevention intervention" includes all type of effects, utilities or benefits. In the literature, the term "outcome" is often used alternatively. Instead, outcome is used in the present study for a particular type of effects accordingly to the chain of effects (intervention logic) of an intervention (see section 3).

- A cost-effectiveness analysis (CEA, Kosten-Wirksamkeit-Analyse) concentrates on the generic effects of prevention interventions measured in natural units (e.g. the number of infections averted, years of life gained, decrease in risk behaviour). These effects can comprise intended and not-intended, intermediate or ultimate changes attributable to a prevention intervention.
- A cost-utility analysis (CUA, Kosten-Nutzwert-Analyse) measures the consequences of an intervention with an utility index. This type of analysis measures the utility of a particular health state (health improvement attributable to the prevention intervention). In other words, utilities aim to reflect the worth of a particular prevention effect for an individual or for the society; how much utility does an increase in life have when it is accompanied by pain or disability? Utilities include a measurement of health state preferences by the population and/or the target population of the intervention. They combine various disparate health effects of an intervention into a single composite util-

[3] Some authors further introduce the cost-minimization analysis as an individual type of efficiency analyses (Widmer/De Rocchi 2012). Cost-minimization analyses aim to identify the most cost-efficient way to cause certain consequences.

ity score (Drummond et al. 2005: 137-209; Gutzwiller et al. 2012: 18-27). The conventional approach uses the concept of quality-adjusted life years QALY (Schöffski/Greiner 2008). This approach weighs the years of life saved with a utility score that reflects the preferences of the affected people for a particular health state (combination of life quantity gains and life quality gains). An alternative approach developed by the WHO is the concept of disability-adjusted life years (DALY) (Schmiedhauser et al. 2010: 24-25; Wieser et al. 2010: 8). DALY are computed by adjusting age-specific life expectancy for the loss of healthy life due to a disability and are based on experts' judgements.

- Cost-benefit analysis (CBA, Kosten-Nutzen-Analyse) translates costs and consequences into the same metric, namely a monetary value. The relation between these two variables can be expressed in a simple term, such as the cost-benefit ratio. Thus, the benefit expresses the consequences of a prevention intervention as a monetary value.

Table 2: Types of economic evaluation (e.g. based on Drummond et al. 2005).

Type of economic evaluation	Measure of costs (resources and money spent for prevention)	Measure of consequences
Cost-effectiveness analysis	Money	Effects / natural units (e.g. averted HIV/STI infections, life year gains, improvement of sexual health)
Cost-utility analysis	Money	Health utilities Integrated measures for health utilities such as QALYs quality adjusted life years gained or DALYs disability adjusted life years gained
Cost-benefit analysis	Money	Money; benefit expresses the monetary value of the consequences

2.2 Categories of costs and benefits

Economic evaluations in the field of public health usually refer explicitly or implicitly to three broad categories of costs and benefits (e.g. Drummond et al. 2005: 24; Zurn et al. 2001: 16-17; Iten et al. 2009: 15-17). These categories include the direct, the indirect and the intangible costs and benefits. Direct costs and benefits include all costs spent or avoided by a prevention intervention. Indirect costs and benefits cover any changes in productivity attributable to a prevention intervention. Intangible costs and benefits stand for any suffering or utility changes attributable to a prevention intervention. Table 3 provides an overview and concretises the categories for the case of HIV/STI prevention.

Table 3: Costs and benefits of HIV/STI prevention measures

	Costs (money spent for prevention)	Benefits (monetary value of the consequences)
Direct	Direct costs of the prevention measures • Personnel, material, overhead and capital costs spent for the implementation of the HIV/STI prevention measure.	Averted direct costs • Treatment costs saved by the prevention of new HIV/STI infections. • Savings of other sectors
Indirect	Productivity losses due to the participation in the prevention measure • Time of volunteers as well as respective transport costs spent to implement and support the HIV/STI prevention measure. • Time and transport costs of the target population for their participation in the HIV/STI prevention measure.	Productivity gains due to the improved health status of the population • Productivity gains due to the improvement of sexual health/averted HIV/STI infection (reduced costs of morbidity/mortality). • Productivity savings in volunteers' and relatives' work time and transport costs.
Intangible	Utility losses attributable the prevention measures • Loss of (sexual) pleasure caused by the HIV/STI prevention measure. • Other intangible costs	Increase in duration and quality of life
Iten et al. (2009: 17) or Schmiedhauser et al. (2009: 15) use similar schemes. Here, we specified the costs and benefits with respect to HIV/STI prevention measures.		

These categories of costs and benefits rely on the possibility of quantification and monetization of prevention effects. This might be possible for some inputs and consequences of a prevention intervention but hardly for all. On the one hand the literature provides different approaches to quantification and monetisation (e.g. for the estimation of productivity gains or the measurement of intangible costs or benefits). On the other hand, economic evaluations often omit some categories. The present study will highlight how the current literature on economic evaluation in the field of HIV/STI deals with these challenges.

Furthermore, Table 3 omits one type of costs that is very much disputed in the literature on economic evaluation in the field of public health, namely the unrelated costs. As prevention measures aim to improve public health, people might live longer and this might result in "additional" costs of health care or of other sectors (e.g. Drummond et al. 2005: 62-64; Iten et al. 2009: 17-18). We omit this type of costs in accordance with the current state of the art.

2.3 Perspectives of the analyses

An economic evaluation can be conducted from different perspectives with respect to who pays for and who benefits from a prevention intervention (Drummond et al. 2005: 17-22). While a societal perspective includes all costs and consequences of HIV/STI prevention measures, no matter who pays or benefits (including the public and private sector as well as the consumers), the health provider and public sector perspective omit some types of costs. The health provider perspective omits the costs and benefits incurred by private consumers (such as participants' time or travel costs). The public sector perspective excludes both the private sector and the private consumers and includes only costs incurred by the public sector in implementing a prevention measure.

Thus, the perspective defines whose costs and benefits are to be included in an economic evaluation. Choosing the societal perspective for the economic evaluation to be commissioned, the FOPH has opted for the most comprehensive perspective that includes all costs and benefits no matter who pays or benefits.

3 The intervention logic of the NPHS 2011-2017

In this section we first provide an overview on the epidemiological trends as well as a short outline of the NPHS 2013. Second, we present the chain of effects of the NPHS 2011-2017. This analytical tool shows how the programme is thought to work and thereby indicates the data requirements for an economic evaluation of its prevention measures.

3.1 Epidemiological trends in a nutshell

Recent epidemiological trends for Switzerland show that there is no relief in sight for HIV and other STI: The number of reported HIV and other STI cases increased in 2012 (FOPH 2012c: 910). While HIV reports declined between 2007 and 2011 from 759 to 564 cases, the FOPH expects an increase of 3-8% of reported HIV diagnoses in 2012 compared to 2011. The FOPH estimates the total number of reported HIV diagnoses to 610 in 2012. The reported number of syphilis, gonorrhoea and chlamydia diagnoses increased considerably in the last years.

There are two core observations that direct HIV and STI policy in Switzerland, namely that the population and Swiss regions are not evenly affected by HIV and other STI (FOPH 2012c: 911). Most affected are men having sex with men (MSM) (FOPH 2012a: 1). Forty-five per cent (nearly 260) of the HIV diagnoses reported in 2011 originated from this group. Further, migrants from countries with a high HIV prevalence, as well as injecting drug users (IDU) are considerably affected by HIV.

The prevalence of HIV and STI varies depending on where people live: large urban centers such as the cities of Zurich, Lausanne, Bern, Geneva and Basel are affected the most (FOPH 2012a: 7). The Swiss cantons can be classified into three groups: Most affected are Zurich, Geneva and Vaud, while Basel, Bern, Luzern, St. Gallen and Ticino are moderately affected, and all other cantons are little affected by the HIV and STI epidemics (FOPH 2012b: 7, 11-13, 16).

3.2 NPHS 2011-2017: Goals and intervention axes

The NPHS 2011-2017 is the Swiss national strategy not only for prevention but also for the diagnosis and treatment of HIV and other STI. Its overall goal is to improve the sexual health of the Swiss population (FOPH 2010: 7). More precisely, it formulates four main goals (the following bullet points comprise excerpts from the programme, ibid. 77-79):

- People living in Switzerland are informed, educated and capable of exercising their rights with regard to sexuality.
- A decrease in the risk of transmission of HIV and other STI.
- Early detection and correct treatment of HIV and other STI.
- The impact of efforts related to HIV and STI is sustained, because it relies on target group participation, is based on scientific evidence and is supported by the population.

The NPHS structures the HIV and STI interventions along three “axes of intervention” (FOPH 2010: 7, 83-85). These three axes address particular population groups. The division into axes is based on the criteria of prevalence and vulnerability (risk):

- Intervention axis 1 targets everyone living in Switzerland (general population) and in particular teenagers, young men and women, Migrants from countries without a generalised epidemic, clients of sex workers and travellers to countries with an epidemic prevalence of HIV/STI.
- Intervention axis 2 targets sexually active individuals with an increased risk of exposure to HIV and/or STI. These risk groups are men who have sex with men (MSM), migrants form countries with a generalised epidemic, sex workers, injecting drug users (IDU) and prison inmates.
- Intervention axis 3 targets individuals with HIV and/or a STI as well as their partners.

Although all three axes comprise prevention of HIV/STI, its emphases differ: For the general population (axis 1) the emphasis is placed on measures aiming to raise the awareness to the value of sexual health. While the emphasis is placed on prevention for people with increased risk (axis 2), for infected persons and their partner (axis 3), the focus is on diagnosis, counselling and therapy. The NPHS defines particular aims, measures and responsibilities for each intervention axis.

The FOPH implements this programme in collaboration with many partners, including cantonal and communal authorities as well as non-governmental organisations.

3.3 Focus of the feasibility study: Prevention measures

While the NPHS is a comprehensive strategy, the feasibility study focuses on HIV/STI prevention measures. Preventive interventions or measures aim to reduce the occurrence, spread and negative effect of these infections. In this feasibility study, we concentrate on behavioural prevention that targets directly individuals as well as structural/contextual prevention that aims to improve relevant social contexts (e.g. risk settings, legislation). Prevention interventions that focus on early detections of these infections (testing, screening) are also included. As the FOPH aims to generate evidence on all three intervention axes, so called positive prevention (Rosenbrock et al. 2009: 25-27) that targets infected people and their partners and aims to reduce the transmission of the infections is also included. We excluded medical prevention interventions such as mother-to child HIV transmission or pre- and post-exposure-prophylaxis.

3.4 Intervention logic of the preventions measures of the NPHS 2011-2017

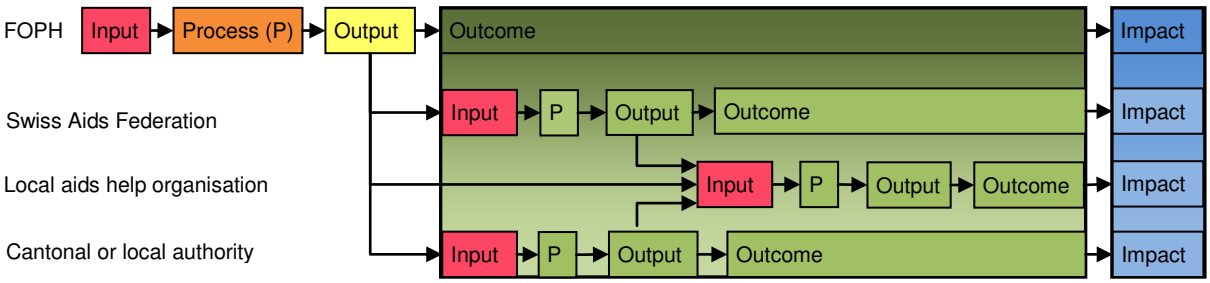
The information requirements of an economic evaluation can be illustrated by the concept of the *chain of effects* (*Wirkungsmodell, intervention logic, program theory*) that is broadly used in policy analysis and evaluation (Chen 2005: 34-38; Frey/Widmer 2011: 496-7; Mohr 1995; Widmer/Frey 2006: 292-4; Mauch/Balthasar 2007: 9). A chain of effects systematises and maps the causal framework of an evaluation object such as the NPHS or its individual measures (e.g. intervention axes, campaigns, projects). In other words, it shows how a programme is thought to work. We distinguish between the five stages of input, process, output, outcome and impact (see Figure 1). Input stands for the costs of both the programme itself and its implementation. Whereas output covers products and services provided directly by a programme and directed toward its immediate addressees, outcome covers the effects of the programme on its addressees. In contrast to outcome, impact stands for the effects on parties other than those directly addressed, or in other words, on people beyond the immediate

addressees. The benefit of a prevention programme is not included as a distinct stage in Figure 1 as it stands for the monetization of its consequences and therefore can relate to all or only to particular consequences at the impact or outcome stage. Figure 1 aims to be as simple as possible to illustrate the basic logic of a chain of effects and therefore, we did not insert the benefit as additional layer.

We elaborated a chain of effects that systematises the intervention logic of the NPHS for the purpose of an economic evaluation. On the one hand, this chain of effects is based on the programme documentation (FOPH 2010) and a report of the Swiss Aids Federation (AHS) that elaborates the chains of effects (Wirkungsmodelle) for the prevention its programmes of the AHS (Ackermann 2012). On the other hand, it is based on our analysis of the international literature on economic evaluation of HIV/STI prevention and on the more general literature on economic evaluation in the field of public health (e.g. Drummond et al. 2005: 19).

We present the chain of effects from the perspective of the FOPH as it is responsible for managing and coordinating the formulation, implementation and evaluation of the NPHS 2011-17 (FOPH 2010: 129). The FOPH aims to lead HIV/STI prevention in the directions of the NPHS 2011-17. Therefore, output stands for FOPH's services and products of the NPHS (see Figure 1). Partner organizations (e.g. Swiss Aids Federation, cantons) as well as target populations (e.g. general population, men having sex with men, migrants, sex workers) are considered as the addressees of the FOPH's services and products. Their implementation efforts and behaviour changes are attributed to the outcome (green box). The impact stands for the broader effects of NPHS 2011-17 at the level of the society. Figure 1 illustrates the basic logic of a chain of effects in a multilevel setting. It is kept as simple as possible and does neither display all involved partners nor specify the levels. It shows that FOPH as well as its partner institutions invest resources to implement the NHPS 2011-17 (red boxes).

Figure 1: Chain of effects in a multilevel setting (Widmer/Frey 2006: 293)



This basic model of a chain of effects needs some adaptation for the purpose of an economic evaluation, in particular for a CBA conducted in a societal perspective that aims to cover all costs and benefits regardless who pays or benefits. In our opinion, such a model needs to depict all categories of costs and benefits of HIV/STI prevention as defined in Table 3. Both, costs and benefits can occur at different stages of the chain of effects. In the literature, the costs are usually depicted at the beginning and the benefits at the end of a chain of effects (e.g. Mauch/Balthasar: 9, Frey et al. 2012: 27).

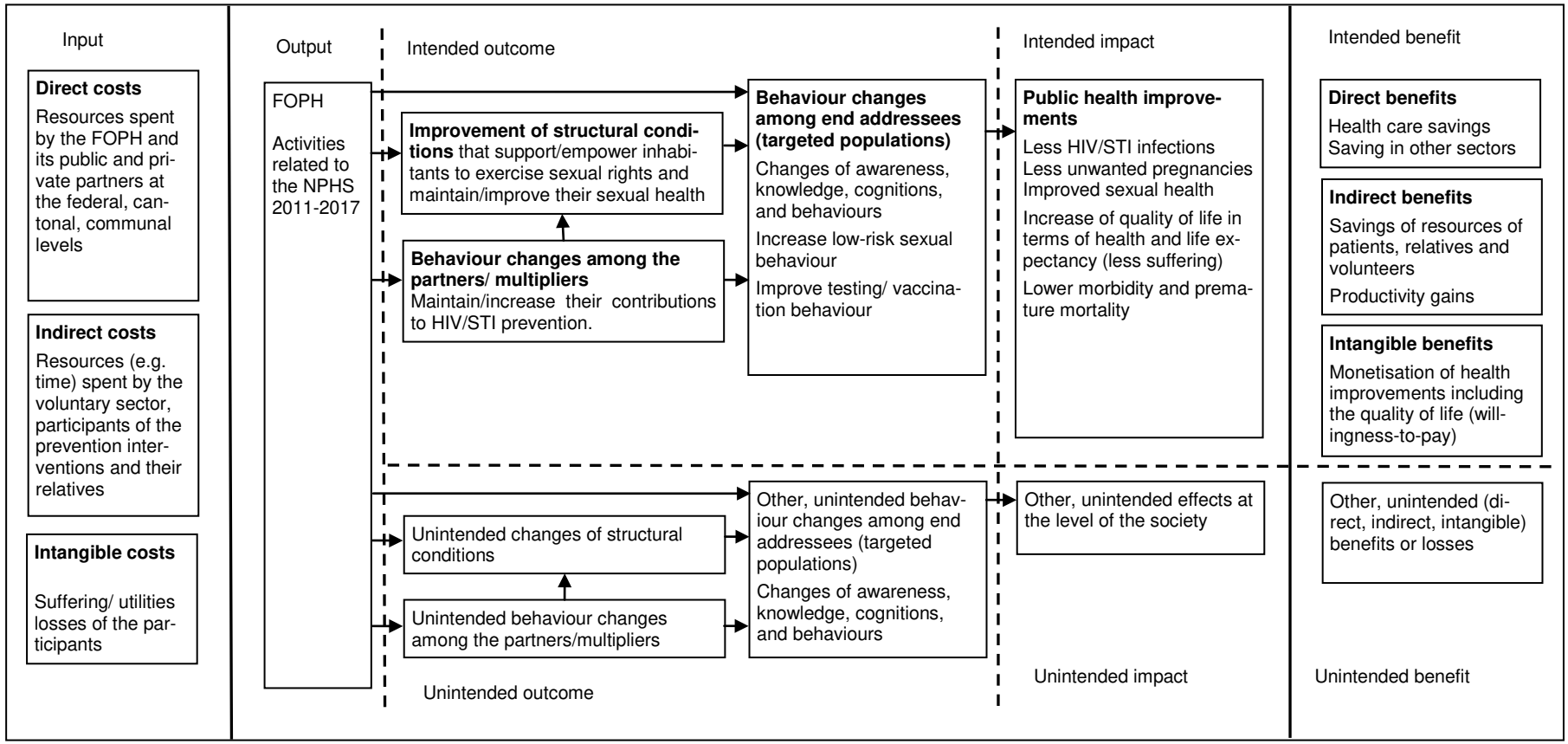
In the following, we define the stages of the chain of effects of the NPHS 2011-17 in a general way (Figure 2). This chain of effects does not display full details (such as concrete campaigns, intervention projects, outcomes among particular target groups) but defines the broad categories that can be modified for any particular area of intervention such as the

three axes of the NPHS 2011-17. Figure 2 displays all stages relevant for an economic evaluation. The stages are specified either according to information obtained from the programme document (FOPH 2010) or by an adaptation of insights from the literature on economic evaluation (see in particular Iten et al. 2009: 15-18, Schmiedhauser et al. 2009; 15-19, Drummond et al. 2005: 19). We omitted the process stage as it is not of primary interest for an economic evaluation that focuses on the consequences of HIV/STI prevention. We depict the input in a separate box on the left edge while the benefit (monetization of the consequences) is displayed in a separate box at the right edge of Figure 2. We opted for this delineation for analytical reasons (see next paragraph), even though the input partially accrues on the outcome stage (costs that are borne by the partners and end-addresses of the NPHS). This also holds true for the benefit that stands for the monetization of the consequences of the NPHS that can occur at the outcome or impact stage of the chain of effects. As introduced in section 2.2, we distinguish between direct, indirect and intangible costs and benefits (see Table 3, Iten et al. 2009: 17; Schmiedhauser et al. 2009:15).

In this way, the relations between input and the consequences can be easily identified. The relation between input and output only assesses the productivity of the FOPH's activities related to the NPHS. The longer the causal chain covered by the relation of interest, the more complex the analysis gets and the more uncertainties are to consider. While CBA relates input to benefits, CEA can either relate input to outcome or impact.

We would like to emphasize that this model serves the reduction of the complexity of the reality for the purpose of an economic evaluation. We aimed to include the categories of costs and benefit discussed in the literature on economic evaluation (e.g. Iten et al. 2009: 15-18; Schmiedhauser et al. 2009: 15, 17, 19). Some of these categories, in particular the intangible costs, are difficult to detect and might not be of great relevance for (some) HIV/STI prevention measures.

Figure 2: Chain of effects of the NPHS 2011-17, general intervention logic



In the following, we describe the individual stages of the chain of effects displayed in Figure 2 in detail. Thereby, we concentrate on the intended consequences of the stages of the chain of effects. However, it is important to consider that the NPHS might cause unintended consequences. Unintended consequences are understood as a broad category of consequences that are not covered by the goals of the NPHS. Such unintended consequences can be known or unknown (anticipated or not-anticipated), negative or positive. An economic evaluation of HIV/STI prevention measures has to consider these unintended consequences.

Input: The input comprises all resources spent for the implementation of the NPHS. The FOPH wants the allocation of resources to reflect the epidemiological developments and to be based on evidence of the effectiveness and efficiency of the interventions (FOPH 2010). A societal perspective includes the resources spent by all involved public or private actors for the formulation, realisation (implementation) as well as evaluation of the NPHS 2011-2017. Various public and private actors at the federal, cantonal and communal levels are involved in these "spending processes" that are to consider in any cost data collection.

Direct costs are important for all prevention measures of the NPHS. They can vary not only with respect to the amounts and relevance of subcategories (see Table 3) but also with respect to the actors and sectors involved in the implementation of individual measures. For example, prevention measures of axis 1 involve the education sector and its actors, while prevention interventions of axis 2 rely on the efforts of non-governmental organisations and can also include social services.

Indirect costs can vary considerably between the measures of the NPHS. They can cover the amount of voluntary work performed and the amount of time spent by the end addresses to participate in a measure. Further, transportation costs are to consider, too.

Intangible costs of prevention interventions stand for any sufferings or utility losses attributable to the NPHS among the end addressees of an intervention. This type of costs is neglected in the literature (see section 4).

Output: The output comprises all activities of the FOPH that are related to the NPHS. We can differentiate between three types of activities: activities directly targeting the end addresses (e.g. LOVE LIFE campaign targeting the general population, the production of a brochure targeting men having sex with men), activities aiming to influence the partner institutions (e.g. contracts with partners for the provision of prevention services) and activities aiming to enhance the structural conditions (e.g. elaboration of guidelines, production and promotion of policy relevant evidence). The scope of action of the FOPH is shaped by the Swiss political system (e.g. competencies of the three federal levels).

Outcome: We can differentiate between three types of outcomes understood as intermediary effects of the NPHS 2011-2017.

Change of behaviour of the end addressees: The causal relation between the interventions and behavioural change (intended reduction of sexual risk behaviour) is thought to work through mediators derived from behavioural science theories. Such mediators drive behaviour changes and include increase of knowledge, changing cognitions (e.g. increase positive attitudes and beliefs about risk reduc-

tion), addressing emotional states (e.g. decrease of negative moods, increase self-esteem, group pride), influencing social norms and support, providing training (skill building) and facilitating the use of relevant services and supplies (Herbst et al. 2007: 41). Sexual behaviour outcomes include, for example, an effective risk reduction strategy, a decrease of the number/proportion of unprotected sex acts, increase of condom use during sex acts. Testing behaviour outcomes are relevant too.

Change of behaviour of the partners/ multipliers: The NPHS aims for the partners to increase or maintain their contributions to HIV/STI prevention in Switzerland. Partners should act in accordance with the NPHS and direct their efforts to the (particularly affected) end addressees or to structural conditions that support and empower the end addressees to maintain or improve their sexual health. Key partners are the cantons, educational institutions, non-governmental organisations such as the Swiss Aids Federations and its members, Sexual Health Switzerland and its members, regional and local HIV/STI centres, medical associations as well as medical HIV/STI specialists (FOPH 2010:129-132).

Change in the structural conditions: The NPHS aims to improve structural conditions to support and empower the Swiss inhabitants to exercise their sexual rights and maintain or improve their sexual health. Conditions are such "that people can fully live undisturbed, low-risk sexuality in a self-determined manner and with mutual respect" (FOPH 2010: 9). Concrete improvements include for instance the integration of age-appropriate sexual health education into the curricula of obligatory and post-obligatory schools or the empowerment of the gay community.

Impact: The intended impact encompasses a decrease of HIV/STI infections, a reduction of unwanted pregnancies as well as an improvement of the sexual health of the Swiss population. (FOPH 2010: 77-78). This impact should ultimately lead to an increase of the quality of life in terms of health and life expectancy.

Benefit: The benefit of the NPHS 2011-2017 calculates the monetary value of its consequences. We can differentiate between the direct benefits (e.g. savings of treatment costs due to less HIV/STI infections), the indirect benefits (e.g. productivity gains due to improved health statuses of the (target) population) and the intangible benefits (e.g. health status maintenance or improvement). A societal perspective includes all type of benefits that can occur at the outcome or impact stages.

This chain of effects highlights that causal chains between the input and the outcome respectively the impact are of different length and complexity. These differences in complexity should be acknowledged when prevention measures are compared (e.g. prevention measures directly targeting the behaviour of the end addresses vs. prevention measures that aims to enhance structural conditions). As the NPHS is implemented in a multilevel setting (three state levels and multiple actors) it is important to realize that a cost-effectiveness-analysis (CEA) could not only investigate the relation between input and the effects among the end addresses (outcome) or at the level of society (impact) but it could be of interest to analyse the relation between input and the outcome among the partners of the FOHP. This latter type of analysis concentrates on the relation between the costs and the activities of the partners. In other words, such an analysis investigates the resource flow in a multilevel setting. It could reveal how much resources are actually allocated to the activities on the three axes of intervention at the cantonal level.

4 Overview of the state of the art in the field of economic evaluation of HIV/STI prevention

This section aims at giving an overview of the state of the art in the field of economic evaluation of HIV/STI prevention. To do so, we looked into the literature regarding Switzerland as well as the current practises of international organisations and, furthermore, conducted a literature analysis of scientific studies and reviews.

4.1 Swiss literature

There is no economic evaluation of HIV/STI prevention measures for Switzerland available. However, there are a few studies that provide economic information for this public health area (e.g. assessment of the social costs of HIV, Zurn et al. 2001). Further, economic analyses dealing with other fields of prevention and health promotion are of relevance for reasons of comparisons as well as for methodological experiences. We have searched the relevant Swiss data bases (ARAMIS, FORS Research Inventory) as well as the websites of relevant organisations for economic analyses dealing with prevention and health promotion interventions in Switzerland.

4.1.1 Economic information in the field of HIV/STI prevention in Switzerland

The study by Zurn et al. (2001) is the most comprehensive economic information currently available in the field of HIV. It assessed the social cost of HIV for the reference year 1998. The authors performed a "bottom-up" analysis and estimated various components of the social cost including direct (outpatient and inpatient care costs) and indirect costs (morbidity and mortality costs). The study results showed that annual cost per patient in Switzerland for the year 1998 is CHF 21'000 and CHF 14'400 for direct and indirect costs respectively (ibid. 54). The total HIV social cost, including direct and indirect costs, amounted to CHF 443 million in Switzerland for the year 1998. The study also estimated the costs for HIV/STI prevention at the nationwide level for the year 1998. The estimate for HIV prevention costs ranges from CHF 41 to 62 million (ibid: 53). The assessment of the prevention costs concentrated on the main programmes related to HIV as "an exhaustive review and cost assessment of all prevention activities directly or indirectly associated with HIV would be extremely difficult" (ibid: 20). The assessment included cost measurements for primary prevention and secondary prevention, namely screening and post-exposure prophylactic treatment (PEP). For the former, cost measurement comprised the HIV prevention budget of the FOPH in 1998, an extrapolation of data from the canton of Vaud for the cantonal and communal HIV prevention costs, condom sales as well as the cost of syringe exchange programmes. Voluntary work was also considered based on data of the Swiss AIDS Federation and valued using the "market cost approach". This study also estimated the cost-effectiveness of HIV prevention per averted cases. However, the analysis was not based on data about the effectiveness of the HIV prevention measures. In contrast, the authors performed a scenario analysis based on the decline of newly reported HIV infections between 1991 and 1998 (decrease of 1'487 cases). They assumed that the reduction in the number of HIV infection cases is attributable to prevention and performed a scenario analysis varying the prevention effect between 10 to 90 per cent of the reduction (ibid 54). The authors concluded that HIV prevention is a cost-

effective intervention, under the hypotheses that life expectancy of a patient under treatment is longer than ten years.

More recently, Auerbach and Früh (2012, confidential report) performed a rough estimation of the direct medical costs for an HIV patient in ART based on data obtained from medical service provider of Zurich and St. Gallen. Thus, this estimation provides new data on the costs of outpatient care (treatment, laboratory, drugs).

Further studies (Neuenschwander et al. 2005a, b; Rosenbrock et al. 2012: 29, 40; Almedal 2012: 14; Plüss et al. 2009: 68-78) collected and analysed the developments in HIV prevention budgets of selected aids help organizations. These studies did not analyse the cost-effectiveness relation of HIV prevention but concentrated on the development of resource allocation.

4.1.2 Experiences from other prevention and health promotion studies in Switzerland

In the last fifteen years, there has been an increasing interest in cost analysis and economic evaluation in the fields of prevention and health promotion in Switzerland (e.g. Brügger et al. 2004; Gutzwiller/Steffen 2000; Iten et al. 2009; Jeanrenaud et al. 2005; Mauch/Balthasar 2007; Telser et al. 2010; Schneider et al. 2009; Wieser et al. 2010).[4] The FOPH commissioned the majority of these studies.

Some of these studies concentrated on the analysis of the literature (Brügger et al. 2004; Meier 2004; Schmidhauser et al. 2009), others aimed to transfer the results about the cost-effectiveness of prevention interventions from other countries to Switzerland (Iten et al. 2009, Galani 2007). A third group of studies measured the costs of a selected health problem (Jeanrenaud et al. 2005, 2003, Telser et al. 2010) or performed an economic evaluation of particular interventions in Switzerland (e.g. Frei 2001; Fueglister-Dousse et al. 2009; Gutzwiller/Steffen 2000; Mauch/Balthasar 2007; Wieser et al. 2010). These studies covered topics such as addictions (illegal drugs, alcohol, tobacco), obesity, diabetes, stress, vaccinations or road accidents.

The review of these studies reveals the difficulty to obtain (comprehensive) data on the costs of the prevention or health promotion interventions in Switzerland. There is no centralized data on prevention or health promotion measures and on the allotted resources. Some studies estimated the costs based on data of the national level and on an extrapolation of the cost data of one canton (Jeanrenaud et al. 2005: 36). To our knowledge, Fueglister-Dousse et al. (2009a: 58-59, b: 13) performed the most comprehensive approach to gather data on cantonal expenditure for prevention. The authors surveyed civil servants responsible for health promotion at the cantonal level (Kantonale Beauftragte für Gesundheitsförderung) in order to measure the cantonal investments for the prevention of smoking and alcoholism between 1997 and 2007. This survey showed that cantonal health services do not have a complete view of the operations carried out on their territory and do not know the sums invested in the prevention of smoking and alcoholism (Fueglister-Dousse et al. 2009a: 58). The authors pointed out that it was difficult to determine the fraction of the expenditure allocated to tobacco or alcohol, especially when the preventative actions relate to several products. Further, they emphasised that cantonal budgets are often not defined by substance but rather

[4] Appendix 11.1 provides an overview of the economic analyses in the fields of prevention and health promotion in Switzerland.

globally dedicated to prevention and health promotion. Additionally, they stressed that the investments by nongovernmental organization were often unknown. Thus, the authors concluded: “The lack of centralised data for the cantonal actions constitutes a major obstacle to a consistent evaluation of the return on the investments for the prevention.” (Fueglister-Dousse et al. 2009b: 13).

The conceptualisation and measurement of the effectiveness of the interventions vary across the studies. Only few studies are based on effectiveness data obtained by an evaluation of (behavioural) effects of the respective interventions implemented in Switzerland (Telser/ Zweifel 2000, Gutzwiller/Steffen 2000; Frei 2001). These studies concentrate each on a particular intervention (prevention of hip fractures respectively heroin maintenance treatment) and performed an ex-ante and an ex-post measurement. Other studies used effectiveness information gathered in other countries (e.g. Galani et al. 2007; Iten et al. 2009). Alternatively, the cost-benefit analyses by Wieser et al. (2010: 25) used a "multivariate regression or other statistical techniques" to estimate the magnitude of the intervention's effect in the field of smoking, alcohol and road accident prevention.

Most of the studies differentiate between direct, indirect and intangible costs that are expended as a result of a health problem. In the case of preventive or health promotion interventions these costs are to be saved by a decrease of the respective health problem. While some studies concentrated on direct and indirect costs and benefits (e.g. Frei 2001; Mauch/ Balthasar 2007), others aimed to cover the intangible values. Some of the these studies performed a cost-utility analysis (CUA) and introduced the approaches of QALY (Galani et al. 2007; Iten et al. 2009) or DALY (Wieser et al. 2010; Fueglister-Dousse et al. 2009a) to consider savings in terms of quantity and quality of life. Cost-benefit analyses that estimated the intangible costs through willingness-to-pay (WTP) are scarce (Telser/ Zweifel 2000).

We can sum up that existing studies for Switzerland demonstrate the difficulty to gather data on the resources spent at the subnational level by cantonal and communal authorities as well as by other private actors. As there are only few studies that performed an economic evaluation, the possibilities for comparisons with other prevention areas are rather restricted. We can conclude that there is not yet a dominant practice how to conceptualise and measure the consequences of prevention interventions for the purpose of an economic evaluation.

4.2 Current practice of international organizations

This section analyses the current practices of international organisations in the field of economic evaluation on the topic of public health. We focus on recommendations, standards and up-to-date tools given out by the World Health Organization (WHO), UNAIDS, World Bank, OECD, European Centre for Disease Prevention and Control (ECDC) and Centers for Disease Control and Prevention (CDC).

For this purpose, we have searched these organisations’ homepages for guidelines, recommendations, previous research and other literature on the topic of economic evaluations in the field of public health.[5] We identified 15 documents that deal with economic evaluation of

[5] The search was conducted primarily through embedded search engines on the organisations’ websites and subsequently following links. Also, external search engines were used in order to look for more specific documents (such as cost-effectiveness analysis of HIV Prevention Interventions) which may not have been found through the primary technique. The search strategy can be found in the appendix (11.2)

public health interventions[6]. Only two of them focus primarily on economic evaluations (UNAIDS 1998 and WHO 2003). Studies conducting economic evaluations are rare[7] and thus the organisations provide hardly any recommendations on how to undertake such studies. Most of the documents included in the review are guidelines or frameworks (CDC undated, OECD 2008, UNAIDS 2000a, 2000b, 2007 and 2010, WHO 2003 and 2008.) which focus on costing or evaluations (often in connection with monitoring) as tools.

Two documents contain rather technical information: UNAIDS (1998) looks into the background, issues and challenges of cost-effectiveness analyses and outlines possible solutions. The second technical document, also by UNAIDS (2009), looks into the assessment of national spending on AIDS, giving out definitions and classifications for relevant programmes and services as well as for the tracking of resources. WHO (1994) is a training manual for programme managers eager to conduct cost analyses. Further, WHO (2009) is a report assembling advices for the health sector on the response to HIV/AIDS. It presents the crucial interventions the health sector should deliver and provides key references and links to resources. Furthermore, World Bank (2004) contains a review of literature on priority setting in health care which looks at the problem of choosing the optimal mixture of programmes that can be afforded with a given budget, while WHO (2006) portrays proceedings from a workshop on scaling-up HIV services in countries and providing them with guidelines on policy formulation, implementation and evaluation.

We will now first look into the recommendations regarding cost analysis and afterwards into those regarding efficiency analysis.

4.2.1 Findings: Cost Analysis

The analysis of the current practices of international organisations shows that no common approach has yet been established in order to specify the costs associated with the implementation of a public health intervention. In the following we present the different views on the important aspects regarding the conceptualization of the costs, as well as on the collection and analysis of cost data.

The question of whose costs need to be calculated is answered by the perspective taken. In the reviewed documents, the societal, provider, public sector and private perspectives are discussed. UNAIDS (2000b: 8) opted in its "*Costing Guidelines for HIV Prevention Strategies"* for a public sector perspective*,* though private costs may be included if they contribute towards financing services. WHO (2003: 19-20, 2008: 14) on the other hand, prefers the societal perspective, arguing that all costs should be taken into account regardless of whom they are covered by (WHO 2003: 19).

Assessing the level on which costs are to be collected, WHO (2003: 30) argues that because some types of costs (such as administrative costs) vary across settings, the analysis needs to be undertaken on a sub-regional, rather than a global level. UNAIDS (2000a: 5-7) mentions four possible levels for the evaluation of AIDS programmes: international, national, district and project level. The literature review shows that costs can be classified in many ways and the organisation agrees that all relevant costs need to be included and categories must

[6] The bibliography of the included documents can be found in the appendix (11.3).

[7] Country reports with the UNAIDS are common and some do include cost-effectiveness exercises, but these centre the treatment. Generally, these reports focus on the country's HIV/AIDS programmes, explaining them as well as covering financing and costing aspects.

not overlap. UNAIDS (2000b: 67-69) provides useful information on types of costs: Economic (opportunity) costs are separated from financial costs. The latter represents actual expenditures on goods and services purchased (how much money has been spent?), while the former also recognizes the cost of using resources. Which type of costs is to be included in an economic evaluation, depends on the objectives of the analysis. Anticipating the collection of cost data, though, it is recommended for cost-effectiveness studies to use the full economic costs of the resources consumed. WHO (2003: 35) gives an overview of possible classifications (by input category, intervention activity or organizational level), and points out that both programme and patient costs should be identified. WHO (2003: 41-42) also points out that volunteer labour should be included as costs if it cannot be assumed that this volunteer labour will always be available. If included, it should be at the cost of employing others to undertake the task (e.g. wage of health personnel). UNAIDS (2000b: 83) includes work of volunteers in the economic costs (see above). A further distinction is made by WHO (1994: 5-9) and UNAIDS (2000b: 40-41) between recurrent or capital costs. Recurrent costs are regular expenditures such as for personnel (including volunteers), supplies or operating costs. Capital costs are expenditures for more durable items such as buildings, start-up activities or one-time publicity campaigns.

Regarding data collection, UNAIDS (2000b, 2009) provides hands-on forms or spread sheets for the in-field data collection of costs or assessments of spending that are applied on an regular basis in country reports[8]. Some documents state practical hints such as what kind of spending categories exist and how they are defined. For example, in its guide to a national spending assessment, UNAIDS (2009: 9) differentiates between three dimensions of cost data: financing, provision and usage of services.[9]

Regarding methodological issues, it is common for the cost analysis to include discounting and a sensitivity analysis: The collected cost data is recommended to be discounted at an annual rate of 3% (WHO 2003: 71) or as UNAIDS (2000b: 69-70) recommends, at the discounting rate used by the relevant economic planning office or Ministry of Finance. If no such rate is available, then a “rate can be taken from economic project appraisals done by other organizations such as the World Bank.”

Sensitivity analysis is also recommended: WHO (2003: 71) advices for the sensitivity of the results to be tested to a rate of 6%, while UNAIDS (2000b: 70) offers three options: “(i) your choice of rate; (ii) twice that rate; (iii) half that rate.”

4.2.2 Findings: Efficiency analysis

Generally, economic evaluation is seen as an essential tool to ensure that the HIV response is based on evidence and provides information useful for making decisions about resource allocation (e.g. CDC undated: 10-12, UNAIDS 2008: 2, WHO 1994: 67).

Regarding different types of economic evaluation, it appears that efficiency analysis (as a generic term, thus also including CUA and CBA) is preferred, as it is mentioned, considered

[8] See http://www.unaids.org/en/dataanalysis/knowyourresponse/nasacountryreports/ [13.03.13] for such reports.

[9] Each dimension consists of two sub-dimensions: Financing consists of financing agents and sources, the former being entities that pool resources and also make programmatic decisions, the latter being entities that provide money to the agents. Provision of services distinguishes between providers, who are engaged in production, provision and delivery of the services, and production factors or resource costs meaning the inputs (labour, capital etc.). Usage includes HIV-related interventions and activities as well as beneficiary segments of the population (e.g. MSM).

or recommended in several documents (OECD 2008 55; UNAIDS 1998: 3, 2000b: 44-45 and 2010: 37; WHO 1994: 55-73, 2003: 3-5, 2006: 7 and 2008: 5-7, 10; World Bank 2004: 7-12). OECD (2008: 55) points out CBA as "the most established approach for the evaluation of intersectoral programmes." Further, OECD recommends combining CBA with CEA in order to make the assessment relevant to different decision and budget perspectives. This is also seen as an improvement regarding the comparability of results across interventions.

Perspective-wise, OECD (2008: 47) sees the perspective of the decision maker as prevalent, but WHO (2003:19-20) prefers the societal perspective. UNAIDS (1998: 4, 2000b: 8) points out that the perspective taken depends on the objectives of the study, but takes on the providers' perspective in UNAIDS (2000b: 8).

With regard to consequence measures, different approaches are known and discussed. Standardization of measurement, which involves clear case definitions and the use of common consequence measures, is widely suggested. For example, strengths and weaknesses of consequence measures such as DALY gained, infections averted, numbers educated or counselled and more, are briefly discussed in the UNAIDS' (2000b: 43) *Costing Guidelines for HIV Prevention Strategies*. The World Bank (2004: 9-10) looks into the most common ways of measurement as well: for each of the consequence measure, strengths and weaknesses (problems) are identified, however, only few recommendations regarding the decision on which measurement of consequences to use are made.[10] OECD (2008: 55) sees quality-adjusted life years (QALY), disability-adjusted life years (DALY) and healthy life years (HLY) as appropriate consequence measures, while (secondary) infections averted is also regarded as a primary consequence (UNAIDS 2000b: 42-44). World Bank (2004: 9) sees QALY as the most prominent measure, but the WHO (2003: 65) prefers DALY. Other consequences described include improved knowledge, changed attitudes, behaviour change and more. Such outcomes are understood as eventually having an impact on HIV or STI transmission (UNAIDS 2000a: 15).

Research designs for the measurement of consequences are only marginally discussed. According to UNAIDS (2000b: 43), the outcomes should be measured in randomized, controlled trial (RCT). Likewise, CDC (undated: 10) names RCT "the evaluation design that is considered to produce the strongest evidence". CDC acknowledges the expensiveness, time-consuming and some ethically debatable aspects of RCT and thus names quasi-experimental designs as an alternative. UNAIDS (2007: 52) considers surveys as important, because they help assessing "the perceptions, behaviours, knowledge, attitudes and infection status of most-at-risk populations targeted by an HIV prevention project or intervention."

Interventions should be measured against the 'null', "i.e. the situation that would exist if none of the set of interacting interventions were implemented" (WHO 2003: 27).

Measuring secondary infections requires knowledge of the epidemiology, behaviour patterns and transmission efficacy (see especially UNAIDS 1998: 7-8). It is also highlighted that, although it is possible to calculate the number of HIV infections directly prevented, measuring secondary infections requires model-based evaluation or randomized clinical trials (UNAIDS 2000b: 42-43).

[10] An overview of the discussed strengths and weaknesses of consequence measures can be found in the appendix (11.4)

The World Bank (2004: 7) emphasizes in "*The Economics of Priority Setting for Health Care"* the importance of including wider societal benefits of an intervention in CBA. These are benefits to third parties like relatives (reduction in time spent caring for the patient), the wider community (reduction in infection risk), or the economy in general (effects on the labour market).

The consensus is that “the calculation of the final impact can be quite difficult and depends on the nature of the prevention strategies being considered” (UNAIDS 2000b: 44).

Methodologically, both quantitative and qualitative methods are to be considered: Quantitative methods are essential for identifying the extent to which programme objectives were achieved whereas qualitative methods are important for gaining a more complete picture of risk behaviour or factors affecting the success of an intervention and for interpreting the quantitative data (UNAIDS 2007: 51-52).

Discounting is advised for consequence measures as well, because it is needed to reflect uncertainty and time preferences (World Bank 2004: 8-9). WHO (2003: 54) advices to discount “future healthy years gained by an intervention at a 3% rate to their present values […].” Sensitivity analysis is also recommended but seen as more relevant for variables that cannot be measured and for which there is no probability distribution: “For CEA, this applies to the two key social choice variables - the discount rate and age weights” (WHO 2003: 74). For variables which can be measured and for which there is an underlying probability distribution, probabilistic uncertainty analysis is suggested to explore the impact of variability.

4.2.3 Summary

This chapter reviewed the international organisations’ literature on cost analysis and economic evaluation. The main conclusion is that although the organisations deal with this subject, recommendations are given out with reservations. The subject and aim of the studies is mentioned in this context, because it influences the choice of methods and the scope of analysis.

The literature on cost analysis has shown that the organisations agree on the necessity to classify and distinguish types of costs, but not on a specific way to do so. Discounting and sensitivity analysis is regarded as a standard procedure while most other recommendations differ.

Regarding economic evaluations, the international organisations’ documents, in summary, brought forward a consensus: such analyses are widely known and supported by all the organisations under scrutiny here. While some recommendations are made, they mostly remain at a simple level. Again, discounting and sensitivity analysis are advised. The main difficulty is thought to lie in the calculation of the final impact of an intervention.

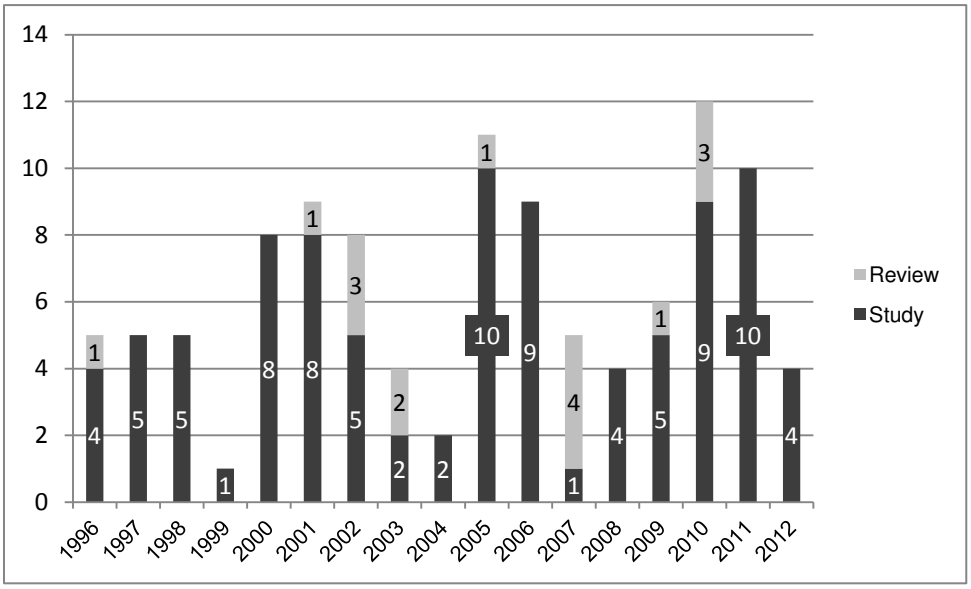
4.3 Overview: Economic evaluations in the field of HIV/STI from 1996 to 2012

This chapter reviews the scientific publications on economic evaluations in the field of HIV/STI, published in peer-reviewed journals between January 1996 and September 2012. It is based on a systematic search of various publication databases.[11] Overall, 108 publications

[11] The following english databases were searched: NHS EED National Institute for Health Research (Economic Evaluation Database), Web of Science, ERIC (education resources information center), Campbell library and Cochrane library. The

were found[12], of which 92 were original economic evaluations of HIV/STI prevention measures, and 16 were reviews on the topic. In the following, we give an overview for all of these 108 documents. Thereafter, we present a more detailed analysis on a selection of the most relevant articles (section 4.4).[13] Figure 3 shows the sustained research interest for economic evaluations of HIV/STI prevention.

Figure 3: Studies and reviews by the year of their publication



First authors from the USA (70.1% of all studies/reviews) and the UK (10.3%) clearly dominate. Geographically, the publications concentrate on the efficiency of prevention interventions in western countries and in particular in the USA. While this finding reflects the state of the research in this field, it can partly be explained by the bias introduced by using only English search terms and databases.

Table 4 displays the infections and regions covered by the studies and reviews. HIV has attracted more research interest than other STIs: 70 studies and 14 reviews concentrate on HIV, 12 studies deal with HIV and STI while 10 studies and 1 review focus on STI other than HIV.

Table 4: Infections and regions covered by the literature on economic evaluations of HIV/STI prevention

	HIV	HIV/STI	STI	**Total**
Africa	10 (1)	4 (-)	- (-)	**14 (1)**
Asia	5 (1)	1 (-)	1 (-)	**7 (1)**
Latin America	1 (-)	1 (-)	- (-)	**2 (-)**
Eastern Europe	2 (-)	- (-)	1 (-)	**3 (-)**
Western Countries (AUS, NZ, USA, CAN, West. Europe)	49 (5)	6 (1)	8 (-)	**63 (6)**
International	3 (7)	- (-)	- (1)	**3 (8)**
Total number of studies / infections	**70 (14)**	**12 (1)**	**10 (1)**	**92 (16)**
Cells contain: Absolute number of economic evaluation before (number of reviews in brackets).				

search procedure and the applied English search terms are described in the appendix (11.2). The considered databases comprise journals (documents) in other languages than English that would be found with English search terms too. Additionally, we searched the relevant German and French journals as well as central public health organisations of France and Germany. Further, we performed rough search with French and German search terms in a database that allow searches in these languages (scorpus). These search activities did, however, not produce conclusive results.

[12] The bibliography for the included 108 documents can be found in the appendix (11.5)

[13] The Codebook for the literature analysis can be found in the appendix (11.6)

Table 5 shows the target populations covered by the economic evaluations and the reviews. An economic evaluation can deal with several target populations. Such cases were coded multiple. The economic evaluations and reviews predominantly deal with the first axis, the second is also represented well, but axis 3 is only covered by eight studies and two reviews.

The analysed period (1996 through 2012) shows no steady development of the number of studies conducted per axis. In 2005, there seems to be a change of trend as the number of studies on the general population (axis 1) has more than doubled.[14] The reason for this is an increase in studies concerned with voluntary counselling and testing (until 2004: 4, afterwards: 13), screening (until 2004: 13, afterwards: 19), male circumcision (until 2004: 1, afterwards: 7) and also mass media (until 2004: 3, afterwards: 9). Further, there is a slight increase in studies covering most of the other interventions. Overall, 62 publications included the target groups assigned to axis 1, 26 included such of axis 2 (high risk of exposure) and nine such of axis 3 (infected people and their partners).

Regarding the interventions considered, there is a difference between studies conducted for western countries and those for other regions such as Africa. In studies concerned with western countries, behavioural interventions such as counselling and education are - screening and testing set aside – predominant, while studies on Africa mostly focus on male circumcision, condom distribution or availability programs and voluntary testing and counselling.

About 60% of the studies were conducted retrospectively, while prospective studies account for about 40%. Within axes 1 and 3 the number of retrospective and prospective studies is near-balance, but for axis 2 retrospective studies represent two thirds.

The studies mostly analysed one intervention, either comparing it to the case where the intervention doesn't exist (on/off comparison) or to other variations of the intervention (e.g. different extents). These two types of comparison account for a bit more than two thirds of all studies. Other bases of comparison include comparing different interventions' effectiveness with each other or with respect to treatment. Taken together, these make up for approximately a fourth of all studies.

For both the time perspective and the basis of comparison, no clear time trend can be identified as their use is scattered over the analysed time period. This result also holds true for these variables' relation with the analysed target groups and interventions.

The studies mostly used QALY and/or infections prevented to measure the effects of the interventions, independently from the axis considered.

[14] For axis 1, from 1996 to 2004 20 studies have been included, while for 2005 to 2012, 42 studies have been found.

Table 5: Target populations covered by the economic evaluations (and reviews) of HIV/STI prevention

			Axis 1					Axis 2						Axis 3
			General population [a]	General population: only HIV Screening	Men	Women	Pregnant women	MSM	Sex work (FSW, MSW and their clients)	Migrants	IDUs	Inmates	Ethically def. populations	Infected people and their partners
Africa			8 (-)		4 (-)	1 (-)	1 (1)		3 (1)					1 (-)
Asia			4 (1)				1 (1)	2(1)	5 (1)	2 (-)	- (1)	2 (1)		1 (-)
Latin America			1 (-)				1 (-)	1(-)	2 (-)					
Eastern Europe			2 (-)								1 (-)			1 (-)
Western Countries	AUS, NZ, USA, CAN		9 (1)	7 (1)	2 (-)	2 (2)	- (1)	15 (3)	1 (-)		14 (3)	3 (1)	3 (1)	5 (1)
	Western Europe[b]		1 (1)	2 (-)	- (1)	- (1)		1(-)			2 (-)	0 (1)	1(-)	
International		No western countries included	2 (2)		- (1)		1 (2)	1(-)	1 (2)		- (2)			
		Including western countries	- (3)		- (1)	- (1)	- (2)	- (3)			-(3)			
Total number of studies / target groups			**26 (12)**	**15 (2)**	**6 (3)**	**3 (4)**	**4 (7)**	**20 (7)**	**12 (4)**	**2 (0)**	**17 (9)**	**5 (3)**	**4 (1)**	**8 (2)**

N = 108 studies
Cells contain: Absolute number of economic evaluation before (number of reviews in brackets).
Studies/reviews dealing with several target populations are counted multiple (for each target population they are dealing with).
Hatched cells depict areas not covered by the analysed literature
[a] including studies/reviews that deal with HIV screening but also (an)other intervention(s).
[b] Barham et al. (2007) includes both Western European countries as well as AUS, CAN, USA; this review was assigned to this row only.
MSM men having sex with men, IDU injecting drug users, FWS female sex workers, MSW male sex workers.

4.4 In-depth analysis of selected economic evaluations

We selected 28 economic evaluations for an in-depth analysis, additionally collecting details such as the main questions of the studies or limitations of different aspects.[15] On the one hand, this selection aimed at concentrating on economic evaluations that deal with prevention interventions in western countries (i.e. Australia, New Zealand, North America and Western Europe). These countries are confronted with similar trends in HIV/STI epidemics. On the other hand, the selection aimed at covering the three axes of intervention of the NPHS. We included ten economic evaluations that deal with interventions targeting the general population and selected the five most recent publications on HIV screening within the intervention axis 1.[16] We included all 16 economic evaluations of prevention intervention targeting MSM within intervention axis 2 and all the articles on prevention interventions of west-

[15] A list of these articles (by axes) can be found in the appendix (11.7)

[16] The older publications are less relevant with respect to Swiss HIV policy as HIV screening is not part of the current policy. Furthermore, the achievements in the developments of the highly active antiretroviral therapy change the prerequisites for screening strategies and thus, the focus on most recent publications seems to be appropriate.

ern countries dealing with infected people and their partners (axis 3). Some of the articles deal with several target groups. Seven studies dealt with more than one axis: Cohen et al. (2004 and 2005) dealt with all three axes, four other articles with axis 1 and 2 (Long et al. 2010; Prabhu et al. 2011; Sanders et al. 2005; Yazdanpanah et al. 2010) and one (Varghese et al. 1999) with axis 1 and 3. Of all the 28 studies, 21 dealt with HIV only, the others dealt with either STI in general or both. Authors' affiliations correlated completely with the countries under scrutiny and were dominated by US-American studies: only three studies were conducted elsewhere, namely Australia (Anderson et al. 2009), Ireland (Gillespie et al. 2012), France (Yazdanpanah et al. 2010).

4.4.1 Topics investigated

Table 6 shows the interventions, time perspectives, bases of comparison and types of economic evaluation found in the studies selected for the detailed analysis. Interventions concerned with screening and/or testing were dominant in studies dealing with axis 1 only. Two out of nine studies dealt with another intervention, while one study (Chesson 2006, dealing with gonorrhoea only) analysed a whole program without describing the interventions, but categorizing them as structural and individual interventions and also looking into treatment. Regarding studies concerned with axis 2 or 3 only, it seems that interventions dealing with counselling or educational approaches are most common. In axis 2 some other interventions appear as well, but only screening is looked at in more than one study. No other interventions were analysed for axis 3. It stands out, though, that studies dealing with more than one axis analysed more and a greater variety of interventions. For example, partner notification, appears three times while mass media campaigns, voluntary counselling and testing (VCT) and others are also of interest. Overall, and apart from screening and/or testing, interventions with a counselling or educational focus are found most frequently. Moreover, the studies concerned with more than one axis are found to have more general goals in terms of the use of cost-effectiveness data. For example, Cohen et al. (2005) aim at optimizing the use of government funds while Yazdanpanah et al. (2010) perform a setting-specific analysis of HIV screening strategies for France. Analyses are mostly conducted retrospectively, but prospective studies make up a substantial part as well. Within axis 1, they almost keep the balance whereas in axis 2, retrospective studies occur seven times, while prospective studies are only conducted three times. It noticeable, that these three prospective studies were conducted since 2009, while the seven retrospective analyses took place in 2002 or earlier.

Regarding the bases of comparison, we can report mixed results: In axis 1 both analyses of interventions against the situation in which the intervention didn’t exist (on/off, often the status quo is such a situation) and analyses of one intervention in different variations are common. In axis 2, on the other hand, on/off comparisons are most common as seven out of nine articles belong to this category. Not surprisingly, studies concerned with more than one axis were found to use other bases of comparisons more often. Three articles compare several types of interventions and two studies looked into interventions and treatment.

Table 6: Interventions, time perspectives and bases of comparison of the selected economic evaluations

	Axes (>1)	Axis 1	Axis 2	Axis 3	Total
Intervention					
Counselling, education	3	1	3	2	**9**
Partner notification	3	0	0	0	**3**
Male circumcision	1	0	1	0	**2**
Voluntary Counselling and Testing	2	0	0	0	**2**
Street outreach	1	0	0	0	**1**
Community-based (e.g. outreach, mobilization)	2	0	1	0	**3**
Condom distribution/availability	2	1	1	0	**4**
Needle and/or syringe exchange/programs	2	0	0	0	**2**
Mass media campaigns	2	0	0	0	**2**
School based interventions	1	1	0	0	**2**
Screening and/or testing	6	5	2	0	**13**
Peer counselling	1	0	1	0	**2**
Treatment of HIV	2	0	1	0	**3**
STI treatment	1	0	1	0	**2**
Overall program (no specification)	0	1	0	0	**1**
Time perspective					
Retrospective	4	5	7	2	**18**
Prospective	3	4	3	0	**10**
Basis of comparison					
On / off	1	5	7	1	**14**
One type in diff. variations	1	4	2	1	**8**
More than one type	3	0	0	0	**3**
Prevention interventions and treatment	2	0	1	0	**3**
Types of economic evaluation					
CEA	2	5	2	1	**10**
CUA	5	4	8	1	**18**
n = 28. Cells contain absolute numbers.					

The publications do not always specify the study period explicitly. For prospective studies, this can be a time frame to which a model is applied. This time frame/horizon varies from one year to twenty-five years. Retrospective studies sometimes relate to a certain time-restricted intervention and name an exact time period. These retrospective studies differ regarding the time analysed as both longer time frames such as more than thirty years in Holtgrave (2002) and short time frames such as one year in Pinkerton et al. (1998) occur.

4.4.2 Perspective and type of economic evaluation

Analysing the perspective taken by the researchers we found that the societal perspective is predominant, as around half of the studies were conducted from this point of view (including three with mixed perspectives). The provider perspective was used in a little less than a fifth of the studies, while the same amount of studies mentioned none of these perspectives at all.

Regarding the types of economic evaluation, CUA dominate, making up for almost two thirds of all studies, while the remaining studies are CEA. Distribution over axes shows that in axis 1 both types are common, while for axis 2 and those studies dealing with more than one axis mostly CUA were performed (8 out of 10 and 5 out of 7 respectively). Interestingly, CUA were performed more regularly in recent years with nine of the sixteen studies dating from 2010 or later. CEA are scattered over the years, 60% occurring between 1997 and 2002. Looking at axis specific development, it can be said there was a change of trend for studies

concerned with axis 1: CUA first appear among these studies in 2011, while only CEA were conducted earlier, the latest one dating from 2006. This is in contrast to axis 2 where CUA appear throughout the years of publication. Regarding the studies concerned with more than one axis, CUA appear as of 2004.

4.4.3 Conceptualization and measurements of the costs

Only three studies refer to overall costs only, while most of the other studies further categorized costs: Personnel costs (16 studies), material costs (19 studies) and overhead costs (11 studies) were mentioned and sometimes detailed values given. Costs that occurred for participants and volunteers were seldom accounted for: Only seven studies (for example Lee et al. 2005: 113; Tao et al. 1998: 86-87; Pinkerton et al. 1997: 349-350) included participant costs, while costs for volunteers were included in Kahn et al. (2001: 485-486) who accounted for travel costs of volunteers and Cohen et al. (2004_ 1406) only. Regarding participant costs, travel costs as well as monetary incentives were the most common additional differentiations.

Regarding data collection, it seems that both primary and secondary data (and a combination of these two) were used to attain cost data of the analysed intervention. But, secondary data was used twice as often. While there is no striking difference between the studies concerned with one axis only, we found that of the studies concerned with more than one axis, only Cohen et al. (2004) and Prabhu et al. (2011) used primary data and used it only in connection with secondary data. The other five studies dealt with secondary data only.

Primary data was often obtained through the staff or records of the intervention. Some studies estimated costs based on the figures available. Cooperation in obtaining data with local authorities can be found as well as data collection at the time of the intervention. Secondary data was obtained from difference sources. The use of existing scientific data was very common. In some cases, researchers would use it to make estimations or use it as made available. Data provided by government authorities was used as well. Some studies combined primary and secondary data, often using certain data from published literature and adding intervention specific data to assess costs.

Discounting was left out in seven retrospective and in four prospective studies equalling a total of more than a third of the studies. Those who did use discounting, mostly chose a discount rate of 3%, which was then often varied in the performed sensitivity analysis (see below).

4.4.4 Conceptualization and measurements of the consequences

The studies applied only few different consequences, with ‘quality-adjusted life years’ (QALY) and ‘infections prevented’ (here also including secondary infections averted and referring to both HIV and STI cases. Though, mostly HIV infections are meant) being the most common. Other measurements of consequences such as ‘life years gained’ or ‘decrease in risk behaviour’ are hardly ever considered. Sexual health neither seemed to be of interest. Furthermore, both studies concerned with axis 3 only used ‘infections prevented’. This may be explained through the considered intervention, as in axis 3 the goal is often to eliminate the risk of partners of HIV positive people to become infected.

Regarding data collected for the measurement of consequences, most of the studies (16) relied on secondary data. These studies collected their data mostly from published studies, but sometimes official sources such as the Centers for Disease Control and Prevention (CDC) were also used. Regarding the published literature used, the various studies by David Holtgrave and Steven Pinkerton (e.g. Holtgrave et al. 1998; Holtgrave 2002; Pinkerton et al. 1997, 1998, 2000b, c, 2001b, 2002a, b; Pinkerton/Holtgrave 2000a) stand out as sources of parameters or values. Four studies worked with primary data only and eight studies – four each of axis 1 and 2 - combined primary and secondary data. It stands out that the studies concerned with axis 3 only are among those working with primary data only. Except for Varghese et al. (1999), all the studies dealing with more than one axis used secondary data. Furthermore, there seems to be no pattern over time at hand.

The consequences were looked into for different time periods. They varied between one year which for example could be the year in which the intervention took place and some of the following months and 'a life time'. The studies of axis 3 dealt with short term consequences and studies of axis 2 can marginally be seen as rather looking at long term results. For all others, no tendency is observable.

Consequences were mostly modelled, with nine studies, including those two dealing with axis 3 only, using dynamic modelling. Gillespie et al. (2012), for instance, used it for projecting the impact of screening on prevalence. The studies working with primary data only all used it for modelling. Estimations are also very common: Anderson et al. (2009), for example, estimated incidence rates. Only two studies (Pinkerton, 2000a; Prabhu et al. 2011) were found to have not estimated any further values. Furthermore, discounting was performed often, mostly at a rate of 3%.

4.4.5 Sensitivity analyses

As almost all studies conducted sensitivity analyses, this can be seen as a standard. Both one- and multi-way sensitivity analyses have been conducted. The authors vary both parameters of costs and of consequences, often applying different ranges. Regarding the ranges used, no general tendency struck the eye and they were often varied differently between parameters. Exemplarily, Long et al. (2010: 784) varied the reduction of sexual encounters after a counselling intervention and Sanders et al. (2005) increased baseline values of HIV incidence by twice and three times that value. Discount rates were also subject to sensitivity analyses with the common rate of 3% often varied from 0% - 5%.

4.4.6 Limitations

Almost all studies discuss limitations of their analyses. Regarding the cost side, limitations to retrospective collection of data were mentioned more than once, as posing an extra challenge and potentially leading to imprecise values. Some authors also criticised that because they ignored certain types of cost, such as start-up costs or fixed costs, the overall amount may have been underestimated.

Limitations regarding the measurement of consequences were discussed more extensively but are also very diverse. The fact that data was estimated or modelled rather than directly measured is criticised several times. For example, Marseille et al. (2011: 93) is critical of his estimates of intervention effects because they are based on changes in behaviour reported by participants. Similarly, Pinkerton et al. (1997: 354 and 1998: 1241) relied on self-reported

sexual behaviour data while Holtgrave et al. (2012: 1119) reckons measuring the impact of an intervention on HIV incidence would be ideal, but is too expensive to conduct. Limited data availability was mentioned by several studies. Furthermore, the strength of evidence regarding the effectiveness of an intervention was questioned. The extrapolation of assumptions from one context to another was also discussed as a possible bias in the estimation of consequences: Gillespie et al. (2012: 226) used data from the United Kingdom and applied it to Ireland, which they criticises as a limitation of their study.

General limitations are discussed as well. It is often said that some model assumptions can be questioned as they may overestimate cost-effectiveness. For example, Heumann et al. (2001: 642) criticised their assumption that people who do not receive a referral (e.g. to HIV testing) in the context of the intervention, do not seek prevention services on their own. If they do, the consequences of the intervention may apply even though no costs have been spent in that case. This leads to an over-estimation of the intervention's cost-effectiveness. Furthermore, researchers acknowledged that their models simplify reality, e.g. sometimes leaving out important aspects such as secondary infections. Furthermore, some studies pointed out small sample sizes as possible sources of biases.

4.4.7 Summary

To sum up, we can say that the majority of the studies examined one intervention only, either in an on/off (intervention takes place or not) situation or by considering variations of the intervention. Researchers predominantly adopted a societal perspective for their analyses and although both CEA and CUA are common, CUA certainly overweigh and seem to be the more recent state of the art. Costs were often categorised into personnel, material and overhead costs. But participant and volunteer costs were seldom accounted for. Regarding cost data, researchers turned to both primary and secondary data, while for data regarding the consequences, the use of secondary data overweighs. QALY and infections prevented were the most common measures of consequences, as sexual health was considered in no study. Methodologically, both discounting and sensitivity analyses were conducted, both for cost and consequence data. Researchers pointed out that data collection was often marred by the retrospective analysis and data on consequences was often relying on scarce amounts of data available.

5 Data availability

The assessment of the available data for an economic evaluation of prevention measures in the field of STI/HIV concentrates on continuous and recent Swiss data sources, mainly published after 2003.[17] Since 2004, the FOPH concentrates on the monitoring of the risk behaviour of the relevant target populations and established a "second generation surveillance system" (e.g. Frey/Kübler et al. 2011, Dubois-Arber et al. 2012). Additionally, the FOPH commissioned a few evaluation studies, expertise and reviews on its HIV/STI policy.

Table 7 to Table 10 provide an overview on the available data sources that can be used for an economic evaluation in the field of HIV/STI prevention. In the following, we will discuss these data along the analytical concepts of the chain of effects (see section 3). Accordingly the tables 7 to 10 are organized along the levels input, outcome, impact and benefit. We omit the process and output levels. The process level is excluded as it is not relevant for the present topic of an economic evaluation. As defined in section 3, the output comprises all activities of the FOPH related to the NPHS. Such information is relevant for the collection of cost and effectiveness data. We assume that the FOPH is able to document its activities.

5.1 Input data

A current estimation of the direct, indirect and intangible costs spent for HIV/STI prevention in Switzerland is missing. However, we assume that a rough estimation of the overall direct costs could be calculated rather easily; e.g. based on the expenses of the FOPH and of one or two cantons (similar to the estimation calculated by Zurn et al. 2001: 20-28). In contrast, a more reliable estimation of the direct cost and in particular a differentiation between the intervention axes requires a considerable research effort and raises the complexity of apportioning. Any effort of collecting data in this realm should consider that sources of funding are multiple and thus, it might be not sufficient to survey only the respective public administrations. More reliable is an approach that includes the (most relevant) local actors that implement HIV/STI prevention measures.

- Collection of input data on the public funds of the national, cantonal and communal level: While it is rather easy to collect the data on third party funding, it might be more difficult to obtain data on the costs spent for personnel, material, overhead and infrastructure for HIV/STI prevention measures within the public administrations. However, we have the impression that the latter costs are not very important at the cantonal or communal level (e.g. Almedal et al. 2012: 14-15, 30, Rosenbrock et al. 2012: 65-66).
- Collection of input data on the non-governmental organisations: While these actors often publish their overall accounts, they might not have such data for each intervention axes or for the individual prevention measures. However, as the pilot study shows, it is possible to obtain such data (see section 6).

To sum up, research efforts to collect data on the direct costs of HIV/STI prevention depend on the number of actors involved in the measures under investigation and on the required degree of comprehensiveness of the calculation. The collection of data on the indirect and intangible costs requires additional research efforts. While responsible local organisations

[17] Between 1987 and 2003, the FOPH had established and maintained an ongoing evaluation system that included evaluation of specific interventions, programme monitoring, and behavioural surveillance (e.g. Dubois-Arber et al. 2003).

that implement the prevention interventions might be able to provide information on the indirect costs (e.g. volunteer's hours, see section 6; hours per participants spent in a prevention intervention), the estimation of intangible costs might require a survey among the participants. However, this latter type of costs is usually omitted in economic evaluations of HIV/STI prevention.

Any assessment of the economic costs of HIV/STI prevention should be based on an elaborate cost data collection and analysis protocol. Such a protocol defines the necessary cost information (e.g. categories) and aims to ensure good quality and comparability of HIV/STI prevention cost data.

5.2 Outcome data

There are some evaluations that provide outcome data either on the behaviour of the FOPH's partners or of the end addresses that could be used for an economic evaluation of HIV/STI prevention (see Tables 7-10).

With respect to outcome data among the end addresses, data is available for intervention axes 1 and 2 but not for intervention axis 3 (infected people and their partners). The data on the behavioural outcome among end addresses is best among MSM and the general population. The evaluation of "Break the Chain" (campaign targeting MSM) includes a before and after measurement of the testing and sexual behaviour of the target population and thus provides the opportunity to measure behaviour changes (Lociciro 2012a). The evaluation of LOVE LIFE campaign (mass media campaign targeting the general population) provides data on the awareness and knowledge related to HIV but does neither include behavioural outcome data nor a before and after measurement (Domenighetti et al. 2009).

The data on the behavioural effects of the prevention measures targeting IDU (except for the data on syringe distribution programmes) and migrants coming from countries with a generalized HIV epidemic is rather incomplete. There is no data available on the behavioural outcome of prevention measures targeting particular groups within intervention axes 1 (e.g. sex worker's clients, travellers) and 2 (female sex workers, prison inmates).

There is no centralised data on the activities of the partners of the FOPH with respect to implementation of the NPHS on the national, cantonal or local level. Such data can be obtained from the partners relatively easily; however there are many partners involved and the activities manifold. Gumy et al. (2012), Almedal et al. (2012) and Rosenbrock et al. (2012) provide an overview on HIV/STI prevention activities in the cantons of Geneva and Zurich.

Further, data on the effects of the NPHS on the structural conditions is very scarce. There is monitoring data on condom sales and syringe distribution but there is no data available on the effects of the NPHS on, for instance, the prevention of HIV/STI in prisons, the integration of sex education in school curricula or the empowerment of the gay communities.

Additionally to data on the effectiveness of prevention measures at the outcome stage, surveillance data provides information on the risk and testing behaviour of the relevant target populations. This data could be used to estimate behavioural effects of prevention interventions at the level of target populations. However, behavioural surveillance data for particular targets groups are missing too (e.g. prison inmates, migrants from countries with a generalized epidemic, sex workers and their clients, see Dubois-Arber et al. 2012: 6-7, Kübler et al. 2012: 8-9). An estimation (modelling) of the effectiveness of HIV/STI prevention measures

based on surveillance data is confronted with several limitations as it is not known who was actually reached with the respective prevention measures with what effect. The identification of and accounting for confounding factors is crucial. Further, it might be difficult to find a meaningful basis of comparison as Switzerland continuously invested in HIV/STI policy.

To sum up, the measurement of the effectiveness of HIV/STI prevention measures among the target populations is still challenging (Smedly/Syme 2001). It has to take into account that the chain of effects can be long and complex, and that it is influenced by several context factors. Additionally, the outcome might require some time to occur; hence the appropriate period of study is unclear.

5.3 Impact data

The following four tables (Tables 7 to 10) show that impact data is rarely available. In other words, existing evaluation studies do not provide information on the number of averted HIV/STI infection, the increase of the awareness to the value of sexual health, the improvement of sexual health or the number of prevented unwanted pregnancies. There are two exceptions: The evaluation of the LOVE LIFE campaign targeting the general population measures the awareness of the general population (Domenighetti et al. 2009) but does not provide information on the behaviour of the target population. The evaluation of “Break the Chain” might provide information on the impact, too, but the final report was not available yet (Lociciro et al. 2012a).

In the literature, measurements of the biological impact (incident HIV/STI) are very rare. Usually, behavioural outcomes are translated into an estimate of the number of infections averted (e.g. Holtgrave/Kelly 1997; Holtgrave et al. 2012). Thus, available outcome data and surveillance data could inform an estimation of the impact of HIV/STI prevention measures (mathematical model). As mentioned in section 5.2, there are some gaps with respect to outcome data and surveillance data of particular target groups.

The calculation of the optimal mix of the prevention measures of the three intervention axes of the NPHS would require data on the sizes of the affected groups as well as HIV/STI prevalence data. Such data is largely missing in Switzerland.

5.4 Benefit data

Tables 7 to 10 show that data on the direct, indirect or intangible benefits of HIV/STI prevention measures is not available. The calculation of direct, indirect and intangible benefits of HIV/STI prevention measures is not possible without information on the outcome or impact. Providing that such data is available, the calculation of the benefits requires further data on the costs of HIV/STI treatment, on morbidity and mortality as well as on the costs related to the suffering caused by HIV/STI. Zurn et al. (2001) provide such data for the first two components for the reference year 1998. Quantitative data on the suffering caused by an HIV/STI infection is not available in Switzerland.

An update of the study by Zurn et al. (2001, see also Auerbach and Früh 2012) is feasible as the relevant databases still exist and in some cases might even provide better data (see Table 20 in the appendix 11.8). On the one hand, it could be more difficult to obtain such data for STI other than HIV because there is no cohort study conducted on these infections. On the other hand, there are still some data gaps (e.g. data for home care or psychotherapy, ab-

senteeism, informal care). Furthermore, the problem of delimiting HIV-related health problems from other health problems needs to be considered. Recent costs studies performed in other countries should inform such an analysis (e.g. Mostardt 2011).

In contrast, a measurement of the intangible benefit of HIV/STI prevention requires the collection of primary data (survey) as no Swiss data is available. However, it is worth to assess the alternative of using QALY data from other western countries.

Finally, these remarks are clearly informed by the dominant measurements of the effects, namely the number of "averted infections" or QALY. These are not the only intended effects of the NPHS and furthermore, not all of its prevention measures prioritise these effects. Thus, alternative concepts are to be considered.

Table 7: Data sources for an economic evaluation of HIV/STI prevention measures of intervention axis 1

Intervention axis 1 Target groups	**Input**	**Outcome**	**Impact**	**Benefit**	**Remarks**
General population	Budget of the LOVE LIFE campaign, FOPH	Evaluation of the LOVE LIFE campaign (Domenighetti et al. 2009).	Domenighetti et al. 2009		Budget data: Working hours of the FOPH and its partners are not included in this budget published on the website of the FOPH. Domenighetti et al. (2009) provide measurements of the awareness, knowledge and attitudes of the target population, but no data on the behavioural outcome or the impact, no before after measurements. Biological and behavioural surveillance data is available (national/regional level), (FOPH, FSO (health survey), IUMSP, eg. Jeannin et al. 2010). Areas of data gaps: – Comprehensive cost data. – Data on the outcome among the partners of the FOPH (further activities of the partners targeting the general population; e.g. counselling and testing). – Outcome/impact among the target population.
Migrants from countries without a generalised HIV epidemic					Biological and behavioural surveillance data available (FOPH, FSO (health survey), IUMSP, eg. Jeannin et al. 2010). Areas of data gaps: – Cost data. – Outcome/impact data
Sex workers clients		Evaluation of "Don Juan" Sex Worker's Client (Balthasar/ Dubois-Arber 2007).			Balthasar/Dubois-Arber (2007) assess the prevention materials, the implementation intensity and whether the target group was reached, no data on the behavioural outcome or the impact. Biological surveillance data (FOPH); behavioural surveillance data till 2007 (IUMSP, eg. Jeannin et al. 2010). Areas of data gaps: – Cost data. – Outcome and impact data.
Travellers					Biological surveillance data (FOPH), behavioural data till 2007 (IUMSP eg. Jeannin et al. 2010).
Educations sector (incl. pupils, young people)		Coverage measure "access to sexual education" till 2007 (Jeannin et al. 2010); causal relation to the NPHS? Cantonal evaluations of sexual educations (see Kunz/Bürgisser 2007, www.amoirx.ch); causal relation to the NPHS?			Biological and behavioural surveillance data (national/regional level) (FOPH, FSO (health survey), IUMSP, eg. Jeannin et al. 2010, Swiss Addictions (health behaviour in school-aged children (HBSC) study), some cantonal surveys). Monitoring data on the cantonal practices (Spencer et al. 2001). Areas of data gaps: – Cost data. – Outcome and impact data.
Shaded cells: No data available					

Table 8: Data sources for an economic evaluation of HIV/STI prevention measures of intervention axis 2

Intervention axis 2 Target groups	Input	Outcome	Impact	Benefit	Remarks
Men having sex with Men (MSM) and male sex workers (MSW) Estimation of the size of the target group, FOPH, forthcoming estimation by A. Schmidt.	Pilot study on the costs of "Break the Chain 2012" Budget share of the AHS 2006-2010 (Plüss et al. 2009).	Evaluation of "Break the Chain 2012" (Lociciro et al. 2012a) Evaluation "Mission possible 2008" (Balthasar et al. 2008) Evaluation of the Checkpoint Zurich (Schwappach/ Bruggmann 2008). Coverage measure: Awareness of prevention activities (Lociciro et al. 2009). Data on the prevention activities of the partners in the cantons of Zurich and Geneva (Rosenbrock et al. 2012, Almedal et al. 2012). Structural prevention: Audits of minimal standards for HIV prevention in gay establishments (VEGAS/FOPH).	*Lociciro et al. 2012a*		Lociciro et al. (2012a) include measures of HIV related knowledge, risk and testing behaviour of MSM and measurements of the activities of the partners of the FOPH. Biological and behavioural surveillance data (national, regional or cantonal level) (FOPH, Gaysurvey IUMSP e.g. Lociciro et al. 2009). Mathematical model was developed to explore the effects of hypothetical prevention scenarios (van Sighem et al. 2012). Areas of data gaps: – Outreach work – Checkpoints (Voluntary counselling and testing facilities) – Prevention targeting MSW – Structural prevention measures
Migrants from countries with a generalised epidemic Estimation of the target group: statistics on migration of the FSO	Budget share of the AHS 2006-2010 (Plüss et al. 2009).	Evaluation of AFRIMEDIA (Hammer et al. 2006) Data on preventions activities of the partners (Manzanares/Ruggia 2011, Rosenbrock et al. 2012, Almedal et al. 2012; Gumy et al. 2012).			Hammer et al. (2006) provide no data on the risk behaviour of the target population, but concentrate on HIV related knowledge, the demand for prevention materials, and on the coverage of the target population. Biological surveillance data is available, FOPH; behavioural surveillance data is limited (Dubois-Arber et al. 2012, Frey/Kübler 2011; Kübler et al. 2012; Jiekak Dommange et al. 2009). Areas of data gaps: – Comprehensive cost data. – Outcome/impact data of further prevention projects targeting migrants or of voluntary counselling and testing facilities.
Injecting drug users (IDUs)	Estimation of prevention costs (Zurn et al. 2001)	Syringes availability, IUMSP (Jeannin et al. 2010). Evaluation of harm reduction facilities (Zobel/Dubois-Arber 2004) Gumy et al. 2012			Biological and behavioural surveillance data (FOPH, IUMSP, e.g. Jeannin et al. 2010, Lociciro et al. 2012b). Areas of data gaps: – Comprehensive, more recent cost data. – Outcome/impact data.
Shaded cells: No data available					

Table 9: Data sources for an economic evaluation of HIV/STI prevention measures of intervention axis 2 (continuation)

Intervention axis 2 Target groups	Input	Outcome	Impact	Benefit	Remarks
Female sex workers Estimation of the sizes of the target group Bugnon et al. 2009.	Budget share of the AHS 2006-2010 (Plüss et al. 2009).	Annual reports of APiS (AHS). Data on preventions activities of the partners (Bugnon et al. 2009, Rosenbrock et al. 2012, Almedal et al. 2012; Gumy et al. 2012).			Biological surveillance data; behavioural surveillance data is limited (e.g. Dubois-Arber et al. 2012; Kübler et al. 2012; Jeannin et al. 2010). Areas of data gaps: – Cost data. – Outcome/impact among the target population (APiS and other projects targeting FSW) – Structural prevention measures
Prison inmates Data on the target population, FOPH, FSO					Epidemiological data is scarce and imprecise Data on the provision of prevention, counselling and testing in prisons (Masia et al. 2007, Achermann/Hostettler 2007). Areas of data gaps – Cost data. – Outcome/impact of BIG (controlling infectious diseases in prisons)
Shaded cells: No data available					

Table 10: Data sources for an economic evaluation of HIV/STI prevention measures of intervention axis 3

Intervention axis 3 Target groups	Input	Outcome	Impact	Benefit	Remarks
Infected people and their partners Estimation of the size of the target group, FOPH, SHCS, forthcoming estimation by P. Vernazza.					Biological and behavioural surveillance data (national, regional level) (FOPH, IUMSP, e.g. Jeannin et al. 2010). Representativeness of the SHCS is unclear, SHCS concentrates on HIV and provides no information on the coverage of prevention activities, etc. Areas of data gaps: – Cost data. – Outcome/impact data on the courses for those with HIV infection and for their partner. – Outcome/impact data on the measures targeting doctors, medical specialists. – Other prevention measures, counselling facilities, campaigns.
Shaded cells: No data available					

6 Pilot study on the collection of cost data

The literature analysis in section 4.1 showed that secondary data on the costs of HIV/STI prevention in Switzerland is scarce and rather inexact. Furthermore, research experience have demonstrated the difficulties to obtain such data as there are many sources (actors/organisations) that invest in HIV/STI prevention.

In order to gain insights on the feasibility of the collection of primary cost data, we conducted a small pilot study. We collected cost data for "Break the Chain 2012 in Zurich". Break the Chain (BTC) is a prevention measure targeting men who have sex with men (MSM). This measure was selected because in Switzerland, MSM are affected the most by HIV and Zurich is one of the regions particularly affected by HIV and other STI (see section 3.1). Additionally, the FOPH commissioned the Institut universitaire de médecine sociale et preventive of Lausanne (IUMSP) to conduct an evaluation of this prevention measure (Lociciro et al. 2012a).

6.1 Description of the prevention measure "Break the Chain 2012"

In collaboration with its partner organisations, the FPOH (2011) is implementing an "Urgent Action Plan" to prevent HIV and other STI among MSM. This plan aims to prevent HIV infections during the primary infection phase, reduce the interval between infection and diagnosis and lower HIV transmission after diagnosis (ibid: 32 -34). A core element of this plan is the annual campaign "Break the Chain" (BTC) that aims to interrupt the HIV transmission chains among MSM.

BTC is based on the assumption that half of all HIV infections among MSM are passed on during the highly infectious primary infection phase which lasts up to three months after the infection. The infectiousness during the primary infection phase is 20 to 100 times higher than later on. In this primary infection phase, the virus is 20 to 100 times more infectious than later on. Therefore, the virus spreads rapidly in the case of parallel sexual relationships during this phase. BTC is a campaign of one month and calls upon all gay men to break the chains of infection, for example by consistently practising safer sex during this period of time..[18] The following quotation of the FOPH's brochure "Sex between Men: Towards a better Sexual Health 2012" expresses the logic of the campaign in a nutshell:

> *"If fewer gay men had unprotected sex during the primary infection phase, the chain of infections would break and the community viral load would reduce overall" (FOPH 2011:* 33).

In 2012, the FOPH commissioned the Zurich Aids Help Organisation (ZAH)/Checkpoint Zurich to implement BTC in Switzerland. The implementation of BTC concentrated on the city of Zurich but also comprised activities in other cities, particularly in Lausanne and Geneva. The campaign was directed by ZAH/Checkpoint Zurich.

BTC uses a community approach and is thought to act as a prevention intervention of the community for the community. Thus, BTC requires the mobilisation of the gay community and the involvement of all actors of the Swiss gay scene. MSM should take an active part in the campaign and act in compliance with personalised recommendations to prevent any new infection or transmission of HIV during one month. Further, the campaign requires that the

[18] The FOPH already implemented such a campaign calling to consistently practice safer sex among MSM during a defined period of time in 2008 (Balthasar et al. 2008; Pluess et al. 2009). In 2008, the campaign was based on the same assumptions, had the same aims but called for a period of three months of safer sex among MSM and was called "Mission Possible".

interface between prevention, testing and treatment is guaranteed. BTC 2012 comprised three stages of intervention (see also Lociciro et al. 2012a: 6-7):

September 2011 to March 2012:

The FOPH developed, launched and promoted its new brochure "Sex between Men: Towards a Better Sexual Health 2012" (FOPH 2011). This brochure addresses MSM and provides information regarding current facts, developments and background on HIV and sexual health between men (FOPH 2011: 1). The FOPH commissioned a consulting company (Life Science Communication AG) to support the development and dissemination and promotion of the brochure. Dissemination and promotion used the following channels: mass media and gay media (PR and ads), internet banners, social media and dating platforms and an information kit for the outreach work of the ZAH/Checkpoint Zurich. Further the campaign material (e.g. brochures, posters, flyers) was distributed to VEGAS Verband Gaybetriebe Schweiz, other gay associations, the AHS and the counselling centres.

→ MSM should increase their knowledge on the relevance of the primary infection phase for HIV transmission and know the symptoms of a primary infection. They are informed about an effective prevention strategy in accordance with their personal situation.

February to April 2012

The ZAH/Checkpoint Zurich motivated MSM to participate in the campaign (practices safer sex during one month, April 2012) and disseminated the prevention messages of BTC over various channels. For example: The (gay) press, videos, internet banners, posters, flyers, smartphone applications, outreach work, involvement of VEGAS, commercial suppliers (bars, clubs).

→ MSM are informed about BTC, comprehend the aims of BTC and identify whether they are part of a transmission chain or not and develop an effective protection strategy in accordance with their personal situation. They are prepared to take an active part in BTC during April 2012 to reduce HIV transmissions in the gay community. They participate in BTC in compliance with an effective protection strategy to prevent any new HIV infection or transmission during April 2012.

Mai 2012

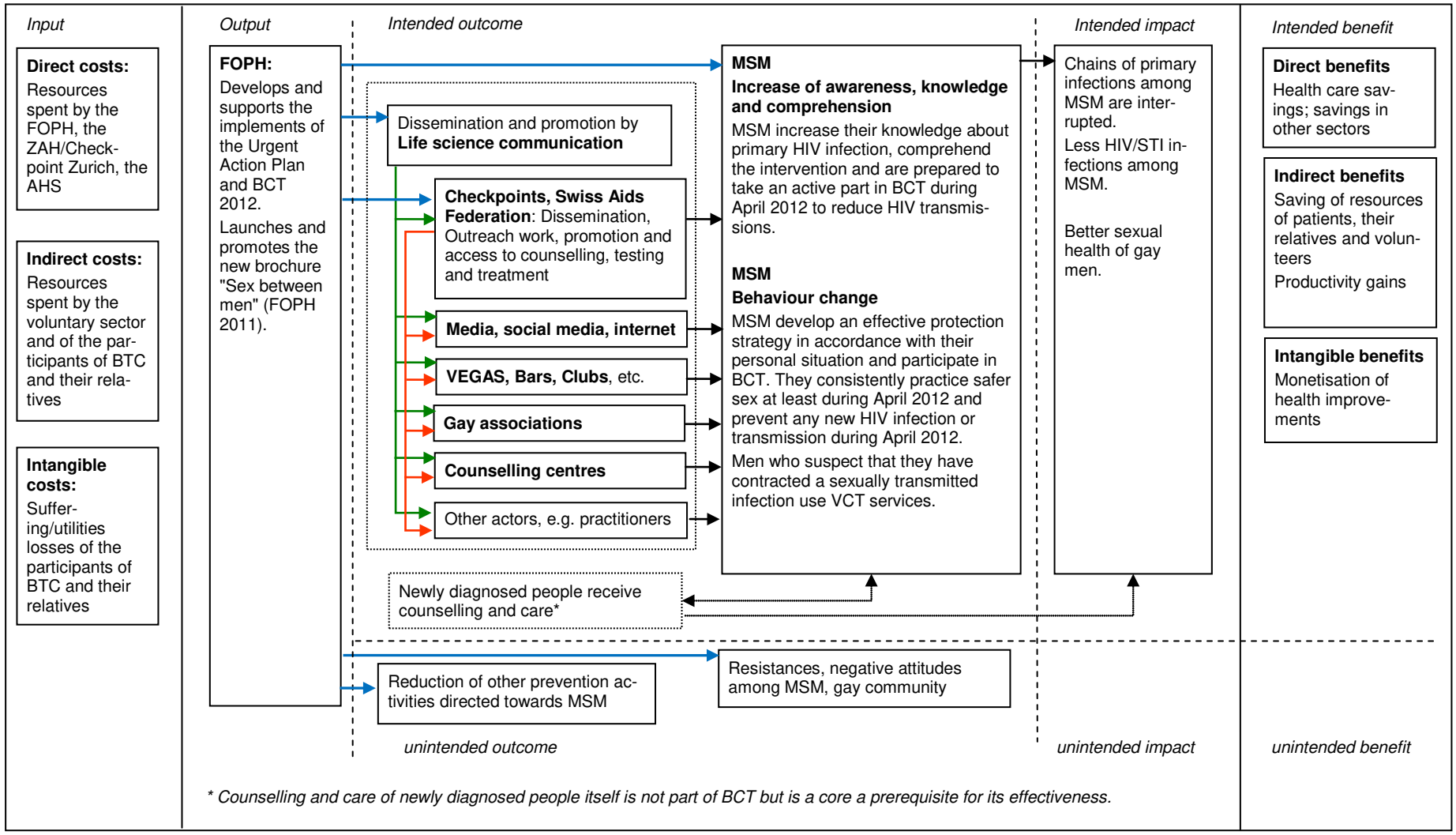
The ZAH/Checkpoint Zurich launched a campaign to promote voluntary counselling and testing. Two HIV tests for the price of one were offered in the case of unprotected anal intercourse and for all those who wanted to practice sexual intercourse without a condom.

→ MSM, particularly those who suspect that they have contracted a sexually transmitted infections, use VCT services.

Figure 4 presents the chain of effects of BTC 2012 that we have developed based on the documentation of BTC and information provided by the FOPH, the ZAH/Checkpoint Zurich as well as the interim report of the evaluation (Lociciro et al. 2012a).

Following the intervention logic of BTC, the intended behaviour changes among MSM should result in a reduction of HIV transmission in the gay community and thereby decrease the viral load in this community. The sexual health of gay men should improve. The prevention of HIV and STI infections results in savings of treatment costs and in productivity gains.

Figure 4: Chain of effects "Break the Chain 2012"



** Counselling and care of newly diagnosed people itself is not part of BCT but is a core a prerequisite for its effectiveness.*

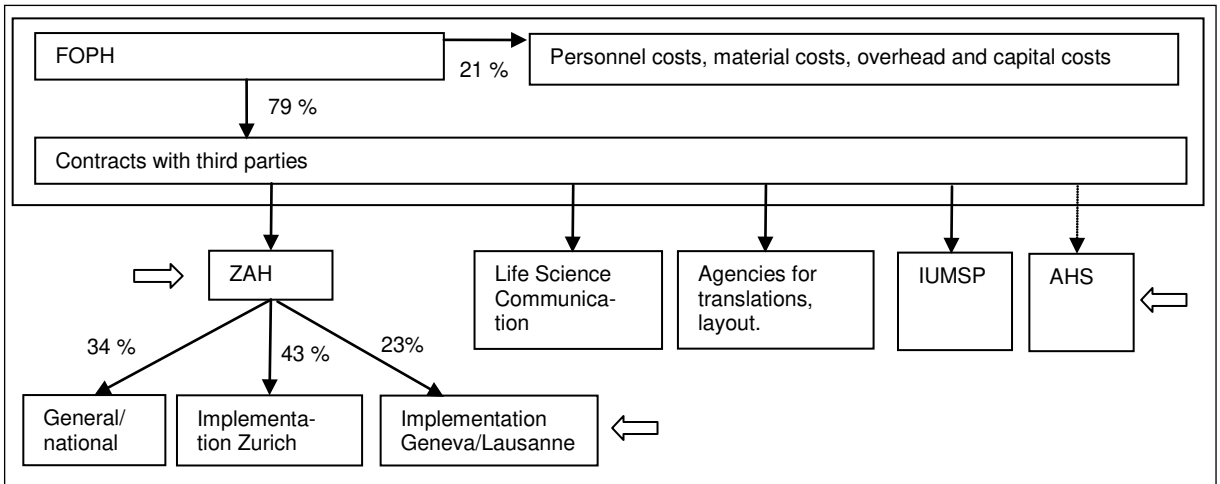
6.2 The collection of the costs of the realisation of Break the Chain in Zurich in 2012

The cost analysis, conducted in a societal perspective, aims to collect all costs of BTC in Zurich in 2012 regardless who paid it and thus, data collections consider all involved actors. According to the involved actors, the development and implementation for BTC 2012 in Zurich took place between September 2011 and September 2012. Thus, the collection of cost data concentrates on this period. We included direct as well as indirect costs while we excluded intangible costs of BTC. Intangible costs of HIV/STI prevention campaigns (utility losses due to the participation in a campaign) are usually not mentioned in existing economic evaluations (see section 4.2.1, 4.4.3). In other words, these intangible costs are not considered as important

With respect to the direct costs, we conducted a full cost analysis including the costs for personnel, material, overhead and infrastructure. In contrast, we did not include all indirect costs attributable to BTC. We collected information on the voluntary work spent to support the implementation of BTC. We excluded the time of end addressees (MSM) spent for the participation in BTC as well as the time of their relatives to support their participation. The time resources that the end addresses and their relatives need to process the campaign's messages, to develop and comply with an effective protection strategy to avoid any infection risk, are considered as not very significant. Further, such costs are usually not considered in the international literature (see section 4).

In a first step, we identified the involved actors. The FOPH and the ZAH/Checkpoint Zurich were the central actors who invested considerably in this campaign. The FOPH and the ZAH/ Checkpoint Zurich commissioned third parties to produce, design and diffuse campaign materials and messages. Additionally, the gay community contributed in terms of voluntary work and with vouchers for special offers. While the Swiss Aids Federation (AHS) also supported BTC the cantonal and communal administrations of Zurich were not involved. Figure 5 depicts the flow of resources and shows that we had to apportion the costs to be able to calculate the costs for BTC in Zurich.

Figure 5: Resource flow "BTC 2012 in Zurich" (direct costs)



The arrow between the FOPH and the AHS is dotted as the contract between the FOPH and the AHS does not earmark a particular amount of money for services of the AHS related to BTC 2012. We included the costs of the AHS allocated to BTC 2012. Details on the apportioning are given in Table 11 and 12.
White arrows indicate that these actors/regions dispose of additional funding sources for HIV/STI prevention among MSM.

In a second step, we identified the main cost components (in terms of (volunteer) activities, personnel, material, and overhead/infrastructure costs) and collected the cost information. While the costs of some components are based on invoices of the FOPH and the ZAH/Checkpoint Zurich, others are based on estimations provided by these actors.

Table 11 calculates the costs spent by the FOPH for the realisation of BTC 2012 in Zurich. It reveals that the FOPH spent approximately 526'000 CHF for the realisation of BTC 2012 and the share for Zurich is estimated at 315'600 CHF. The estimation is based on the costs for the production of the brochure "Sex between Men" (FOPH 2011) and the costs for the development, implementation and evaluation of BTC 2012. The former costs are not fully attributable to BTC 2012 as the brochure is also used for other prevention measures. The FOPH spent approximately 79% of its BTC costs for services by third parties. ZAH/Checkpoint Zurich received the highest amount, in order to raise the campaign. While this share of 79% is documented by contracts and invoices, the internal costs of the FOPH are based on estimations provided by the FOPH.

Table 11: Costs spent by the FOPH for the realisation of BTC 2012 in Zurich

FOPH: Costs for BTC 2012		
Costs for the brochure "Sex between Men"		
Type of costs	Costs in CHF	Comments
Personnel	(74'233)	Source: FOPH, estimation of the work time spent by the responsible staff of the FOPH
Overhead/infrastructure	(14'847)	Estimation, 20 % of the costs for personnel. The personnel costs does not included the costs for the infrastructure etc.
Contract with third parties		
Concept, editing, communication, promotion, distribution	107'979	Source: FOPH, contracts/invoices
Design and Layout	29'408	Source: FOPH, contracts/invoices
Translation	8'317	Source: FOPH, invoices
Print costs	23'418	Source: FOPH (Federal Office for Buildings and Logistic bore theses expenses)
Subtotal Costs for the production of the brochure "Sex between men"	(258'202)	
Subtotal Costs of the brochure allocated to BTC 2012 (30%)	(77'460)	This brochure was a key element of BTC but was used for other prevention activities. According to the FOPH 30% should be attributed to BTC 2012.
Realisation of Break the Chain 2012		
Type of costs	Costs	Comments
Personnel	(69'715)	Source: FOPH, estimation of the work time
Overhead/infrastructure	(13'943)	Estimation, 20 % of the costs for personnel. The personnel costs does not included the costs for the infrastructure etc.
Contract with third parties		
ZAH/Checkpoint Zurich	286'750	Source: FOPH, Contract, 74% of the Budget 387'500
Evaluation IUMSP	78'192	Source: FOPH, Contract
Subtotal: Costs for the realisation of BTC 2012	(448'600)	
Total costs of BTC 2012	**(526'060)**	
Total costs attributable to BCT in 2012 Zurich	**(315'636)**	Share of Zürich is calculated based on the resource allocation of the ZAH/Checkpoint Zurich, 60%, see Table 12
This calculation does not include the costs of the FOPH to participate and present BTC at international conferences. Further, the costs to conduct the present cost analysis are not included. Finally, the FOPH commissioned the AHS to conduct HIV/STI prevention directed to this target population. Thus, the resources spent by the AHS for BTC 2012 in Zurich are likely to originate from the FOPH. Numbers in brackets are estimates or calculations including estimates. Numbers without brackets are directly derived from invoices, contracts.		

Table 12 presents the costs calculation of the ZAH/Checkpoint Zurich. This calculation provides the bases to apportion the share of Zurich. The main cost components are paid ser-

vices by third parties. These services include the design, production and diffusion of campaign materials and tools (e.g. website, film, banners, ads in (gay) press, smart phone applications). This amount of 336'824 CHF is documented (invoices). As BTC was the main preoccupation of the responsible collaborators during the campaign, the estimation for personnel and material seem to be fairly precise. In contrast, we added 10% for overhead and infrastructure. This estimate is rather low. In total the ZAH spent 422'700 CHF for the realisation of BTC 2012 in Switzerland. The FOPH financed 68% (286'750, earmarked money for BTC, see Table 11) of this amount. We do not have data on the sources of remaining 32% (e.g. the ZAH receives funds from the cantonal and communal authority).

Table 12 Costs spent by the ZAH/Checkpoint Zurich for the realisation of BTC 2012 in Zurich

ZAH/Checkpoint Zurich: Costs of BTC 2012					
Type of cost	Costs on CHF				Comments
	Total	General/ national	Zurich	Geneva	
Personnel	(68'406)	(27'363)	(27'363)	(13'681)	Source: ZAH, calculation of shares: 40% general/national, 40% Zurich, 20% Geneva,
Materials, travel costs, etc.	(9'663)	(3'865)	(3'865)	(1'933)	Source: ZAH, calculation of shares: 40% general/national, 40% Zurich, 20% Geneva,
Subtotal internal costs	(78'069)	(31'228)	(31'228)	(15'6145)	
Subtotal incl. overhead/infrastructure 10%	(85'876)	(34'351)	(34'351)	(17'175)	Estimation, 10% of internal costs.
Paid services by third parties	336'824	110'692	145'434	80'698	Source: ZAH, invoices. This costs cover development, design as well as diffusion of communication materials (e.g. internet, banners, ads in (gay) press, smart phone applications).
Total Costs of BTC 2012	(422'700)	(145'043)	(179'785)	(97'873)	
Costs percentages	100%	34%	43%	23%	
Apportioning of national cost (145'043) to Zurich and Geneva, Lausanne, other regions: ¼ of the national costs for other regions (Bern, Bale) and of the remaining ¾ we apportioned $^{2}/_{3}$ to Zurich and $^{1}/_{3}$ to Geneva, Lausanne and other regions. Numbers are set in brackets as they are based on estimates					
	Costs in CHF				Comments
	Total share of Zurich		Total share of Geneva, Lausanne, other regions		
Total Costs of BTC 2012	**(252'306)**		(170'394)		Estimation
Cost percentages	**60%**		40%		
Numbers in brackets are estimates or calculations including estimates. Numbers without brackets are directly derived from invoices, contracts.					

Table 13 reveals that the estimate for the costs of the tests performed for free is low and negligible. However, it should be discussed whether the costs for the increase in test uptake should be included.

Table 13: Costs for HIV tests performed for free by the Checkpoint Zurich

Checkpoint Zurich: Number of Tests and costs of tests during BTC 2012			
Type of costs	Number	Costs in CHF	Comments
Tests promotion, tests conducted free of charge by the Checkpoint Zurich	15	(747)	Costs of an HIV test: 49.80 CHF, source ZAH. ZAH estimated that ten to twenty of all tests performed among MSM (approx. 140) in May 2012 were performed for free.
BTC 2012 led to an increase in test uptake by 17 % (Lociciro et al. 2012a). It is to discuss whether these costs should be taken into account. The data on the absolute number of the performed test in Zurich was not yet available from the evaluators as the final evaluation report is not yet published. Numbers in brackets are estimates respectively calculations including estimates.			

Table 14 presents the estimation of the costs spent by the AHS for BTC 2012.

Table 14: Costs spent by the AHS for the realisation of BTC 2012 in Zurich

AHS: Costs of BTC 2012		
Type of costs	Costs in CHF	Comments
Personnel	(13'418)	Source: AHS, includes mainly the time spent for coordination meetings.
Material	(1'155)	Source: AHS, includes the costs for the distributions of BCT campaign materials as well as some operating expense.
Subtotal, costs of BTC 2012 excl. overhead/ infrastructure	(14'573)	Source: AHS
Costs of BCT 2012 incl. overhead/infra-structure	**(16'030)**	**10% for infrastructure etc. (1'457)**
Total costs attributable to BCT in 2012 Zu-rich	**(9'618)**	Estimation, share of Zürich is calculated based on the resource allocation of the ZAH/Checkpoint Zurich, 60%, see Table 12
Numbers in brackets are estimates respectively calculations including estimates.		

Table 15 reveals that the voluntary sector contributed, through voluntary work and special offers, in a considerable way to the promotion of BTC 2012 in Zurich. These estimations were provided by the ZAH and shortly discussed with the board of VEGAS.

Table 15: Indirect Costs, voluntary time spent for the realisation of BTC 2012 in Zurich

Voluntary sector, only estimations for BTC in Zurich displayed				
Type of costs	Number	Hours (cumulated)	Costs in CHF	Comments
Volunteers ZAH	10	(300)	(18'900)	Estimation of the ZAH,
Outreach ZAH	3	(95)	(5'986)	Estimation of the ZAH
Gay establishments	51	(255)	(16'065)	5 hrs per establishment based on information of the ZAH and of the board of VEGAS.
Subtotal, volunteers' time		*(650)*	*(40'950)*	*Wage per hrs of voluntary work: ZAH proposes 60.- CHF; Zurn et al. (2001:22) used 32.- CHF in 1998 according to market cost approach, the FOS calculates 48.9 (without management function) and 85.2 (with management function) per hrs of institutional voluntary work in the reference year 2010. We opted for 63.- based of the FOS wages ($^2/_5$ with management function, $^3/_5$ without management function).*
Vouchers of the Gay establishments	(3600)		(126'000)	Estimation of the ZAH. This estimation is rather vague. Vouchers included very different offers (drinks, meals, entries, haircuts, E-bikes). ZAH suggested to value one voucher with 35 CHF.
Total costs of the voluntary sector			**166'950**	

The last table of this cost analysis consolidates the costs from the different sources. Thus, the costs for the realisation of BTC 2012 in Zurich are estimated to be 574'098 CHF. This estimation includes a considerable amount of voluntary resources. In an economic evaluation, the sensitivity analysis should consider that these voluntary resources are based on rather raw estimations (particularly with respect to the vouchers).

Table 16: Consolidation of the costs attributable to BTC 2012

	Total costs		Share of Zurich	
	Costs in CHF	Share	Costs in CHF	Share
BAG	(526'060)	78%	(315'636)	55%
ZAH/Checkpoint*	(135'950)	20%	(81'147)	14%
AHS	(16'030)	2%	(9'618)	2%
Subtotal	**(678'040)**	**100%**	**(406'401)**	
Voluntary sector			(166'950)	29%
Tests			(747)	0%
Total costs of BTC 2012 in Zürich			**(574'098)**	**100%**

* 32 % of the costs of the ZAH are included the remaining 68% are included in the costs spent by the FOPH.
Costs are displayed in brackets as they are based on estimations.

As the IUMSP has not yet finalised the evaluation of BTC 2012, we do not discuss any relation between the costs and the consequences of BTC 2012 in the present report.

6.3 Key insights of the pilot study

On the one hand, we were confronted with the problem of apportioning costs incurred at the national level for the implementation in Zurich. On the other hand, BTC did not directly involve the cantonal or communal administration of Zurich and thus, we did not include any costs spent by these institutions. We could not obtain detailed costs data for the overhead and infrastructure costs of the involved actors and therefore used a discretionary rate.

Although the involved actors supported the data collection, we needed considerable period of time to obtain the cost data. The actors had to compile the data sources and estimations. Thus, a cost analysis is a rather time-consuming task not only for the evaluators but also for the affected actors.

7 Assessment by the Surveillance Working Group

The design of the feasibility study was discussed by the Surveillance Working Group of the FCSH in its meeting in October 2012.[19] In the following, we present the main points of the discussion.

7.1 Delimitation: Does surveillance encompass economic evaluations?

At the very beginning of the discussion, the question was addressed whether an economic evaluation and its feasibility constitute a relevant issue within the field of HIV/STI surveillance.

The Working Group emphasised that surveillance data provide insights on the epidemiological and behavioural developments but cannot be easily linked to prevention measures. Thus, in order to be a meaningful tool for surveillance, an economic evaluation requires additional data on the causal relation between the prevention measures and its consequences.

7.2 Conceptualisation of the key variables

The Working Group raised major concerns about the appropriateness of a cost-benefit approach in the field of HIV/STI as it requires a quantification of the input and the consequences of HIV/STI prevention measures.

The Working Group shared the opinion that the input of a prevention measure should not be reduced to the money spent but should also include the efforts deployed by the communities and volunteers. The feasibility study should take into account that the implementation intensity might vary geographically and across time.

The (intended) consequences of HIV/STI prevention are likely to include effects that are not directly measureable and/or quantifiable. The question of the appropriate base line for the economics was raised (e.g. the number of lives saved, the appropriate monetary value of a life, treatment cost saved). The discussion pointed out that prevention measures might not only aim to prevent infections but also to increase public health in general. Furthermore, it was emphasised that the analysis of an infectious disease requires a dynamic model.

Summing up, the Working Group recommended that the feasibility study should not reduce its perspective on quantifiable variables.

7.3 Geographical delimitation

The Working Group suggested considering a geographical delimitation of the economic evaluation. The economic evaluation could focus on regions that are particularly affected by HIV/STI, or could select some regions in order to realise a meaningful comparison.

[19] Roger Staub and Christine Heuer from the FOPH also attended this meeting. The members received a summary of the concept of the present feasibility study for the preparation of the discussion. Kathrin Frey presented the concept at the meeting and Daniel Kübler chaired the discussion.

7.4 Focus of the literature analysis

The Surveillance Working Group emphasised that the literature review should not be restricted to economic evaluations but also include the literature on the effectiveness of HIV/STI prevention. It suggested restricting the literature analysis on effectiveness information to reviews.

Additionally the Working Group recommended to analyse how WHO, OECD, ECDC and the Global Fund decide on the allocation of resources in the absence of strong economic evidence.

7.5 Results of the Surveillance Working Group's discussion

The results of the discussion with the Working Group can be summarised as followed: The feasibility study and its goals are, for an economic evaluation, ambitious and should be reduced. It is of interest to have data on the resources spent for HIV/STI prevention in Switzerland that take into account the multiple actors involved at the federal, cantonal and communal level. An economic evaluation should consider that not all relevant components of the input and the consequences are quantifiable. Evidence on the effectiveness of HIV/STI prevention is crucial for an economic evaluation and a literature review of this strand of research could provide helpful insights.

8 Assessment by Swiss health economists

We conducted five expert interviews with renowned health economists to assess the main challenges of an economic evaluation of HIV/STI prevention in Switzerland.[20] The interviews were conducted face-to-face and tape-recorded. They concentrated on the possibilities and limitations of an economic evaluation in the field of HIV/STI prevention in Switzerland, the assessment of the topics the FOPH aims to cover with an economic evaluation as well as on crucial conceptual and methodical issues of such a study.

8.1 General expert assessment of the potential of an economic evaluation in the field of HIV/STI prevention

All interviewed experts agreed on the relevance of an economic evaluation of HIV/STI prevention measures in Switzerland. They shared the opinion that such an analysis is useful for policy-making. However, they were rather sceptical of an encompassing economic evaluation that covers all topics that the FOPH has formulated.

The experts pointed out that the main challenge in this field is neither the economic part of an evaluation nor the Swiss context but the proof of effectiveness of the HIV/STI prevention measures (robust findings for the causality between the policy measures and the respective consequences). They emphasized that prevention effects are difficult to measure as they cannot be observed directly and as it is difficult or even impossible to conduct randomized controlled trials. They pointed out that the interventions' effects might require some time to materialize and multiple factors – not only prevention interventions – influence behaviours of the population and epidemiological developments. The interviewees critically assessed the possibility of a multivariate regression model that uses mainly epidemiological surveillance data to estimate the effectiveness of HIV/STI prevention.

In other words, the interviewees shared the opinion that the robustness of an economic evaluation highly depends on the quality of the data on the effectiveness of HIV/STI prevention. As none of the interviewees had particular knowledge on existing effectiveness information in the field of HIV/STI, they expressed rather general concerns.

While no expert contested the potential of a CEA, CUA and CBA were disputed. The interviewees shared the opinion that a CEA generates relevant information on the relation between the costs of HIV/STI prevention measures and the number of "averted infections". This type of analysis is useful to compare different prevention measures. It does not allow comparisons with other public health areas. Further, the assessment of a cost-effectiveness ratio of an individual measure (programme) requires a discretionary threshold.

With respect to the CUA, the interview discussions concentrated on the approach of QALY to express the utility of a public health intervention. The opinions whether or not to use this approach and conduct a CUA differed: Some interviewees strongly recommended performing this type of analysis mainly for reasons of comparisons with other health areas. They stressed that a utility measure includes intangible values that are not considered in a CEA which measures the consequences of prevention only in terms of "averted infections". The interviewees in favour of a CUA using QALY emphasised that this approach predominates

[20] List with interview partners (11.9) and the interview guideline (11.10) are displayed in the appendix

the field of health economics. They also acknowledged its limits but stressed that the use of QALY within one particular health area is less problematic. They pointed to the importance of the measurement of the QALY to be based on surveys with infected and non-infected people and taking into account that treatment success might depend on the time of infection detection. A CUA has to acknowledge that QALY depend on the available treatment at a particular time. Future changes in treatment might affect both, the quality and duration of life. Some interviewees shared the opinion that it is feasible to either gather primary data for QALY or to use QALY measured in other countries of Western Europe or even the USA.

Other interview partners formulated strong reservations to this approach in conceptual and methodological terms. Further, they emphasised the difficulty of communicating the results of such analysis to policy-makers and the public. They stressed that this approach is limited to the area of health. Furthermore, they emphasised that this approach always activates the ethical questions of the monetary value of life: How do we assess the ratios of cost to QALY saved?

All interviewees shared the opinion that a CBA would require a high level of extra efforts to monetise all consequences and to conduct a "willingness-to-pay (WTP)" study. In contrast, they assessed the added value of such an analysis quite differently. Interviewees clearly preferring a CUA attributed no additional value to a CBA. In their view, methodological concerns together with the difficulty of communicating the results of a CBA outweigh its advantages. Interviewees in favour of a CBA stressed that only this type of economic evaluation takes into account the preferences of the (affected) population(s) and provides an assessment whether the benefits of a particular policy measure equal or outweigh its costs. These interviewees also acknowledged that a CBA multiplies the complexity of the delimitation of the costs (increasing the problematic of double counting of some costs or benefits).

To sum up, this spectrum of opinion highlights that the conceptualisation and measurement of intangible values (individual pain and suffering) are much contested. In contrast, the interviewees well agreed on the calculations of savings in terms of medical care costs and productivity (reduced morbidity and mortality). One interviewee argued that these economic savings are assumed to be considerable in the case of HIV. Therefore, the measurement of individual suffering and pain related to HIV is not absolutely necessary and can be omitted not only due to conceptual and methodological concerns but also for pragmatic reasons. Further, findings about the suffering of the infected individuals and their relatives could be presented convincingly without a quantification and monetisation.

8.2 Expert assessment of the study's topics as formulated by the FOPH

In general, the interviewed experts largely agreed in their assessments of the study's topics the FOPH has formulated to guide this feasibility study (see section 1.1).

The interviewed experts welcomed an economic evaluation from a *societal perspective* that includes all costs and consequences of HIV/STI prevention measures, no matter who pays or benefits. They emphasised that the analysis should aim to realize such a perspective but might exclude some costs or consequences. Some costs and consequences might turn out to be negligible or strong feasibility constraints hamper their inclusion (e.g. indirect costs of the volunteers or participants of a specific prevention intervention, intangible benefits of averted HIV/STI infection).

With respect to the costs of the prevention measures, they emphasized the relevance of including not only the resources spent by the FOPH but also collecting information on the resources spent by other public and private actors. They shared the opinion that the collection of such cost information is labour-intensive and requires enquiries of the people in charge. Furthermore, they emphasized that it might be difficult for the people in charge to estimate, for example, personnel resources spent for particular prevention measures (e.g. axes). The interviewed experts pointed out that the volunteer time is at least conceptually a relevant category. They had no firm opinion on whether this cost category (opportunity costs) needs to be included in an economic evaluation of HIV/STI prevention measures. The interviewees shared the opinion that it is relevant to produce cost data that show how many resources are spent for the different axes of HIV/STI prevention.

With respect to the consequences of the prevention measures, they pointed out that a societal perspective would require considering all consequences of the HIV/STI prevention measures. In particular, they mentioned any savings resulting from a prevention measure in terms of medical costs, productivity and individual suffering.

All interviewees shared the opinion that the question of where HIV/STI prevention resources (efforts) are spent most effectively is crucial. A comparison between the three intervention axes of the NPHS would provide relevant information for the formulation of HIV/STI policy. The interviewees agreed that it is important to understand the relation between the costs and the achieved effects within a particular target group (The relation is moderated by the group size and the prevalence of HIV/STI). In this respect, they also welcomed the aim to calculate the optimal allocation of prevention resources among the three intervention axes. Some experts pointed out that the interpretation of such a calculation should acknowledge that it is not known how the relation between policy (efforts/costs) and behaviour changes (epidemiological changes) performs when efforts are increased.

Further, the interviewed experts pointed out that such an analysis requires good evidence for all prevention measures and thus, it is related to a high effort of research. Additionally, the interviewees highlighted the problematic of interactions between the axes. They raised concerns whether the effects of the prevention measures of the axes can be isolated (problematic of delimitation/attribution; e.g. the LOVE LIFE campaign is addressed towards the general population, but the risk populations are also part of the general population).

In contrast, the interviewed experts questioned the feasibility of a separate analysis for the resources spent by the FOPH. Such an analysis is only appropriate when the input of the FOPH is attributable to particular consequences. The experts strongly questioned the possibility of isolating the particular contributions of the FOPH to the effects of the prevention measures. Several interviewees pointed out, that such an analysis is only possible if the FOPH has financed particular prevention measures entirely and if the effects of these measures can be separated from the effects of other measures implemented in the same time period. Some experts mentioned that scenario analysis might be helpful in this respect. Others pointed out the relevance of knowing whether the cooperation between the FOPH and its partners functions in an effective and efficient way.

The interviewees emphasised that an economic evaluation constitutes one particular source of information in a decision-making process and should always be complemented with other information, and in particular with ethical considerations. Some interviewees highlighted that an economic evaluation usually neglects considerations of equity.

8.3 Expert recommendations

In a nutshell, the interviewed experts recommended to lower the ambitions and to start with a concrete, reduced study focus. If such a study reveals useful results, further studies can be conducted subsequently. Several interviewees shared the opinion that it is worth to know how resources are allocated for HIV/STI prevention and how much HIV/STI costs the society in terms of medical costs and productivity losses.

- The analysis should concentrate on the comparison of policy measures (intervention axes).
- The analysis should take into account direct as well as indirect costs and benefits. Voluntary sector could be neglected if it contributes less than 2%.
- The interviews are not conclusive whether or not intangible consequences should be considered.
- While the results are considered being very useful for policy decisions within the field of HIV/STI, some interviewees warned that the results might not help to justify HIV/STI prevention spending against other areas.
- Such economic information should not be the only decision criteria but serve as additional input.
- The realisation of an economic evaluation is costly.
- Data sources in Switzerland are fragmented.
- Discounting costs and consequences should be done as it is state of the art in the field of economic evaluation (rate of 3% or 3.5%).
- Sensitivity analyses are considered as very important (probability analysis).

9 Synthesis and concept for an economic evaluation of HIV/STI prevention measures in Switzerland

In this final section, we first present the synthesis of the findings on the feasibility of an economic evaluation of prevention measures in the field of HIV/STI prevention. Thereafter, we concretise the concept for a feasible economic evaluation.

9.1 Main findings

In the following we synthesise the findings on the questions 1 to 4 of the present feasibility study, while questions 5 and 6 are answered in the last sections of this report.

1. What is the scientific state of the art in this field?

Generally, economic evaluation is seen as an instrument to generate policy relevant information on the efficient allocation of resources in the field of public health and more narrowly in the field of HIV/STI. The current practice of international organisations reveals that economic evaluations do not enjoy a very high profile; documents that focus primarily on this type of evaluation are rare. The literature review shows that the economic evaluation of HIV/STI prevention continues to be a topic of scientific interest. However, the majority of the studies reviewed here examined single interventions. We found only two analyses dealing with western countries (namely the USA) and covering prevention measures of all three intervention axes of the NPHS (Cohen et al. 2004, 2005). Thus, economic evaluations dealing with multiple prevention interventions do not (yet) represent a common approach.

Cost-utility analyses using QALY dominate the field. The analyses are most frequently conducted from a societal perspective including all costs and consequences of a HIV/STI prevention measure. Study designs included anything from randomized control trials to prospective models[21] that estimate the cost-effectiveness of (hypothetical) prevention interventions. Discounting and sensitivity analyses are state of the art. The costs of an intervention were often categorised into personnel, material and overhead costs, while participant and volunteer costs were rarely accounted for. QALY and “infections prevented” were the most commonly used measures for the utility of HIV/STI prevention interventions effects. Mathematical models are used to convert self-reported behavioural changes (e.g. increases in condom use or decrease in needle sharing) resulting from the intervention into an estimate of the number of infections averted.

There are well-recognized limitations of economic evaluation of HIV/STI prevention and in particular with respect to their comparability. The most fundamental concerns concentrate on the measurement of the effectiveness respectively the mathematical models of HIV transmission to estimate the epidemiological impact of the prevention interventions.

[21] E.g. Juusola et al. (2011) use a dynamic model of HIV transmission and progression to compare the cost-effectiveness of alternative testing strategies with the next twenty years, from 2009 to 2029. Gillespie et al. (2012) used a dynamic model to estimate the potential cost-effectiveness of opportunistic screening for Chlamydia in Ireland that had not yet introduced this intervention.

2. Availability of data on the costs (input) spent for HIV/STI prevention in Switzerland, potential of secondary analyses and possibility of primary data collection?

While there is a lack of pre-existing data and therefore no potential for secondary analyses, the presented pilot study on the costs of the realisation of “Break the Chain” 2012 in Zurich showed that it is feasible to collect such data at a reasonable evaluation effort. However, such an analysis requires a considerable contribution by the actors involved in the realisation of the respective measures.

Any assessment of the economic costs of HIV/STI prevention should consider direct as well as indirect costs (in terms of volunteer work). Further, it is important to include the local actors who are responsible for the realisation of HIV/STI prevention. Field research should be guided by an elaborated cost data collection protocol. Such a protocol defines the necessary cost information (e.g. categories) and aims to ensure good quality and comparability of HIV/STI prevention cost data.

3. Availability of data on the consequences of HIV/STI prevention in Switzerland, potential of secondary analyses and possibility of primary data collection?

The availability of data on the consequences (effects) of HIV/STI prevention is fragmentary. Data on the chain of effects, that investigates the relation between the input and the consequences (outcome/ impact) of a prevention measure, is rather scarce. Surveillance data is available but it does not cover all relevant target populations. Furthermore, data on other STI than HIV is even more limited.

4. What are the implications and challenges for an economic evaluation of HIV/STI prevention in Switzerland?

Expert interviews and discussions with the Working Group Surveillance showed that an economic evaluation would be welcomed in general. The main concerns relate to the difficulties to conceptualise and measure the effectiveness of HIV/STI prevention. Some of the experts fear that such an analysis might end up in concentrating on the consequences that are easily to quantify and neglecting other relevant consequences.

Furthermore, the fragmentation and decentralisation of data sources, the multilevel setting as well as the involvement of various actors in prevention activities increase the effort required to perform an economic evaluation.

The co-operative approach adopted in the implementation of the NPHS makes it impossible to reliably attribute achieved consequences to a selected single actor.

9.2 Requirements of the FOPH on an economic evaluation of HIV/STI prevention in the light of the findings of the present feasibility study

In the following, we critically assess the topics the FOPH aims to cover with an economic evaluation and formulate recommendations on the contents of an economic evaluation.

We recommend dismissing the separate estimation of the efficiency of the resources spent for HIV/STI prevention by the FOPH for reasons of feasibility.

The expert interviews revealed that a separate estimation of the efficiency of the FOPH resources spent for HIV/STI prevention is hampered mainly due to the problem of attribution. We share this assessment as the NPHS and its measures are implemented through the cooperation of multiple actors. Several actors are involved in the realisation of prevention measures of more than one intervention axes. The cooperation and funding take place across the axes. Therefore it is hardly possible to link the consequences of the cooperative realisation of the NPHS to the individual actors in a meaningful way. Thus, we recommend dismissing this topic for reasons of feasibility.

We recommend not opting for a cost-analysis instead of an economic evaluation of the consequences of the NPHS.

Although expert interviews revealed that a cost analysis should be considered as an alternative or first step to obtain more economic information on HIV/STI prevention in Switzerland, we argue that such an analysis is not worth conducting at least in its pure from.[22] Such an analysis provides no information on the efficiency of the resource allocation. However, it could be of interest to investigate the HIV/STI prevention resource flow within the Swiss multilevel setting. Such an analysis would include the outcome of the NPHS among the partners of the FOPH. In other words, it investigates how the partners allocate the resources to the different prevention measures (activities per axes of intervention): Is the FOPH able to direct the resource allocations in the intended ways of the NPHS?

We recommend that any comparisons of the intervention axes of the NPHS 2011-2017 should acknowledge the different goals of these axes.

While the expert interviews revealed no major concerns related to the comparison of the intervention axes of the NPHS 2011-2017, we would like to point out that such a comparison is not as unproblematic as it seems. These axes of intervention not only differ with respect to the target populations but also with respect to the goals (intended consequences) and the emphasis placed on the prevention of HIV/STI infections (FOPH 2010: 93-105). Thus, it might be inappropriate to measure the effectiveness of the intervention axes with the same variables (indicators). While the intervention axis 1 places more emphasis on an increase of the awareness related to issues of sexual health as well as the reduction of HIV/STI infections and unwanted pregnancies, intervention axis 2 clearly concentrates on HIV/STI prevention. This problematic is accentuated with respect to the intervention axis 3 that targets infected people and their partners. In this axis, prevention aims at HIV-infected persons being alerted not to pass on the virus and uninfected partners being motivated not to become infected (ibid: 93).

[22] Although the study of Zurn et al. (2001) on the social cost of HIV was and still is of relevance, we think that an extended update of this study should not be considered as an alternative to an economic evaluation.

These differences between the intervention axes do not render a comparison impossible but any comparative analysis has to acknowledge them.

We recommend that any comparisons within the intervention axes should take into account the differences in goals and in the ways of influence of those prevention measures targeting structural conditions and those directly targeting individual behaviours of the end addresses.

The NPHS not only aims to directly influence the sexual behaviour of the Swiss population and particular target groups but also to improve structural conditions that support and empower the Swiss population to exercise their sexual rights and maintain or improve their sexual health (FOPH 2012:9). The improvement of structural conditions should ultimately contribute to an improvement of the sexual health of the Swiss population (decrease of HIV/STI infection and unwanted pregnancies). These indirect ways of influence are more complex and might require more time to operate than direct behavioural interventions. Thus, any economic evaluation has to take into account these differences in the intervention logics.

9.3 Concept for an economic evaluation of HIV/STI prevention measures

In this section we present two alternative concepts for the realisation of an economic evaluation of HIV/STI prevention measures and thereby answer the questions 5 and 6 of the present study.

5. Which HIV/STI prevention measures should be considered?

6. How should a feasible economic evaluation be designed?

Based on the above presented findings, we have the opinion that there are two feasible but very distinct alternatives: Alternative A consists in opting for a mathematical modelling study that estimates the efficiency of the NPHS 2011-2017 and performs scenario analyses with respect to the mix of prevention measures (intervention axes). In contrast, alternative B opts for a step-by-step approach and proposes to start with very restricted but concrete economic evaluations. Table 17 shows how these alternatives cover the topics that the FOPH is interested in:

Table 17: Overview on the proposed alternatives

Questions raised by the FOPH	Alternatives		Remarks
	A	B	
The overall cost-benefit-relation of HIV/STI prevention in Switzerland? Cost-benefit relation of the three axes of intervention?	■		A comparison between the axes of intervention has to take into account the differences in goals as well as in the ways of influence (chains of effects).
Cost-benefit relation of the FOPH resources spent for HIV/STI prevention?			Not feasible
Optimal allocation of prevention measures (resources) among the three axes of intervention of the NPHS?	■		
Cost-benefit-relation of prevention measures for MSM in Zurich?		■	This alternative could analyse further prevention measures or the resource flows, but does not cover the entire NPHS.

None of these two alternative covers all the topics the FOPH is interested in. Further, the alternatives differ in fundamental aspects such as research aims and questions. As we think the FOPH first needs to discuss and decide on these two fundamental alternatives, we have

not elaborated a detailed evaluation design. Instead, we outline these two alternatives in greater details in the following.

Alternative A: comprehensive model estimating the efficiency of the NPHS 2011-2017

Alternative A concentrates on the estimation of the overall efficiency of the NPHS as well as on the comparison between its axes of intervention. This alternative could additionally include scenario analyses to find "the" optimal allocation of resources for prevention measures among the three axes of intervention. In contrast, this alternative does not include an economic evaluation of HIV/STI prevention for MSM in Zurich.

Such a comprehensive perspective that covers multiple prevention interventions is not well established in the international literature. In contrast, we found only two articles that compare several interventions of the three intervention axes (Cohen et al. 2004, 2005). This alternative A, respectively the FOPH topics, is clearly informed by the work of Cohen et al. (2004, 2005). Cohen et al. (ibid) developed a tool using mathematical models to estimate the relative cost-effectiveness of 26 HIV prevention interventions including biomedical interventions, structural interventions, and interventions designed to change risk behaviours of individuals. This tool aims to help local communities to maximise the impact of their HIV (but not STI) prevention resources. The analysis calculates the cost-effectiveness ratio based on the total cost of an intervention divided by the number of HIV cases prevented (= costs per HIV case prevented). The number of prevented HIV cases was estimated with mathematical models using secondary data on the group sizes, HIV prevalence, the sexual behaviour (number of partner, frequency of sex acts) and parameters measuring the effectiveness of interventions (such as changes in condom uses, number of sex partners) (Cohen et al. 2004: 1406). Cohen et al. (2004, 2005) developed a practical tool (spreadsheet) for community planning groups and health departments.[23] We would like to point out that we do not know whether the tool of Cohen et al. was actually used by local communities in the USA or elsewhere. Further, this tool has three general limitations with respect to its applicability to the Swiss context. First, it concentrates on HIV while the NPHS includes other STI as well. Second, it is developed for the local level and does not take into account different levels. As the Swiss regions are differently affected by HIV/STI it would be important that the model could deal with this epidemiological differentiation, particularly with respect to the calculation of the optimal mix. Third, the effectiveness data used by Cohen et al. (2004) mainly originates from studies respectively interventions conducted before 2000. This data does not reflect the changing nature of the HIV/STI epidemic of the last fifteen years. A Swiss analysis should be informed by more recent effectiveness data.

We suggest that such an analysis elaborates an enhanced mathematical model that aims to cover the NPHS 2011-2017 as comprehensively as possible. The modelling study should use the available Swiss data (see section 5). When Swiss data on the effectiveness of a particular HIV/STI prevention measures is not available, the analysis should be informed by secondary data from other western countries. However, this might not be meaningful with respect to the costs of an intervention. Thus, alternative A might require a rough estimation of the costs of the prevention measures based on primary data.

We are not totally convinced that such a mathematical modelling study is worth the research efforts. On the one hand, the potential of such an analysis is reduced by the availability of

[23] http://www.rand.org/pubs/drafts/DRU3092.html

data and thus, the uncertainties are manifold. Some of the data gaps and limitations might be resolved in the near future. The timing of this alternative should take into account these developments. On the other hand, the potential of such a mathematical modelling study to inform policy-makers is limited due to its focus on averted infections. Cohen et al. (2004: 1410) show that the factors which most strongly determine the cost-effectiveness of programs are the HIV prevalence in the target population and the cost per person reached by the intervention. Thus, interventions in a population group with a low HIV prevalence need to have an extremely low price per person reached to be cost-effective. Interventions that target populations that have a high prevalence of HIV can be cost-effective even when the implementation cost per person reached is considerable. This means for instance that any intervention targeting the youth, e.g. school children, are not likely to be cost-effective primarily because the HIV prevalence in this groups is very low (ibid). Of course, an economic evaluation should not be considered as decisive; other critical factors to be considered are political, ethical or social issues. Thus, it could be argued that the added value of such an economic evaluation does not very much exceed an expertise based on evidence available to date. Table 18 provides an overview on this alternative of an economic evaluation of HIV/SIT prevention measures in Switzerland.

Table 18: Overview on alternative A

Alternative A: Mathematical modelling study about the cost-effectiveness of the NPHS	
Study aims	Estimation of the cost-effectiveness of the NPHS and of its intervention axes. This alternative aims to cover the NPHS as comprehensive as possible (including all relevant target population respectively prevention measures).
Questions	• Which is the overall cost-effectiveness-relation of HIV/STI prevention in Switzerland? • Which are the cost-effectiveness relations of the three axes of intervention of the NPHS? • Which is the optimal allocation of prevention measures (resources) of the NPHS?
Design	Mathematical modelling study
Main data sources	Mainly secondary data from existing outcome evaluations and surveillance data. Additionally, secondary data from other western countries might inform the analysis when Swiss data is missing.

Alternative B: Stepwise approach through selective economic evaluations

Alternative B aims to produce empirically robust findings on the efficiency of selected prevention measures. Thereby, the comprehensive perspective is abandoned for a stepwise approach. On the one hand, the majority of the interviewed experts recommended a stepwise approach and a reduction of the research topics. On the other hand, the presented literature analysis showed that clearly focussed studies on particular prevention intervention dominate the field.

The selection of prevention measures should follow the principle of effectiveness: Economic evaluations should concentrate on the areas where the results of the economic evaluation are most likely to have an impact on the policy (Widmer et al. 2001: 89). In areas where a policy change is not considered as feasible for other, e.g. ethical or political reasons, it is not worth to conduct an economic evaluation. Additionally, the selection of prevention measures should consider the availability of data.

A stepwise approach that starts with one to three rather small economic evaluations facilitates a substantial involvement of the commissioners, the potential users of the findings of the economic evaluation(s) as well as the stakeholders such as prevention and medical specialists. On the one hand, narrowly defined evaluation objects (particular policy measures

implemented in a defined geographical area) also delimitate the addressees of the evaluation itself. On the other hand, the stepwise approach is open-ended and offers the possibility to (re-)direct the study based on interim findings and discussions with key users. In this way, policy-makers (programme managers) receive more opportunities to bring in their perspectives and needs for policy relevant economic information. Policy-makers also progressively get to know what economic evaluations can contribute with respect to policy decisions. However, the disadvantage of this approach is, of course, that it provides no ultimate directions how to allocate the resources to the three intervention axes.

Although alternative B should draw as far as possible on available secondary data, the production of primary data is part of this alternative too.

In line with the FOPH research interests and according to insights gained from the expert interviews, we suggest that alternative B should first concentrate on the topic of HIV/STI prevention targeting MSM in Zurich. The very first step should concentrate on the prevention campaign “Break the Chain”. The cost data generated in the present feasibility study should be used to perform an economic evaluation based on the effectiveness data produced by the IUMSP (Lociciro et al. 2012a). The results of this economic evaluation should be discussed with the main actors. In a second step, other prevention measures targeting MSM in Zurich could be investigated. In a further or parallel step, this alternative could either opt for an economic evaluation on prevention measures targeting another risk group, investigate prevention measures targeting MSM in a distinct geographical area (e.g. Geneva and Lausanne) or concentrate on the resource flows of HIV/STI prevention in Switzerland and thereby focussing on the outcome of the NPHS among the partners of the FOPH. The latter analysis investigates how the partners allocate the resources to the different prevention measures: Is the FOPH able to direct the resource allocations in the intended ways of the NPHS? Such an analysis was less present in the interviews and the investigated literature.

This alternative B abandons the aim to cover the entire NPHS in one evaluation study but could generate information how to further develop economic data collection and analyses in the field of HIV/STI. Table 19 provides an overview on this alternative.

Table 19: Overview on alternative B

Alternative B: Stepwise approach to produce empirical findings on the efficiency of selected prevention measures	
Study aims	Alternative B aims to produce empirically robust findings on the efficiency of selected prevention measures. It aims to further develop economic data collection and analyses in the field of HIV/STI.
Questions	• Which is the cost-effectiveness relation of Break the Chain in Zurich? • Which is the cost-effectiveness relation of prevention measures for MSM in Zurich? Additionally, this alternative could deal with the following questions. Alternative B should not aim to cover all this questions but select the most relevant and perform a stepwise approach. • Which is the cost-effectiveness of prevention measures for MSM in Geneva and Lausanne? • Which is the cost-effectiveness of prevention measures for other selected risk groups in Zurich? • Which are the flows of resources in the field of HIV/STI prevention in Switzerland (NPHS)? Is the FOPH able to direct the resource allocations in the intended ways of the NPHS?
Design	Empirical analysis of the cost-effectiveness of selected prevention measures; complemented by mathematical modelling if necessary.
Main data sources	Collection of primary data particular on the cost of the selected prevention measures and on the effectiveness when secondary data is not sufficient.

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11 Appendix

11.1 Swiss literature on economic analysis in the field of prevention and health promotion (including cost analysis)

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11.2 Search strategy literature analysis

Search of documents of the international organizations	
Organization	CDC, ECDC, OECD WHO, World Bank and UNAIDS.
Sources/database	Official homepages of the organizations, September/October 2012.
Type of documents	• Guidelines and recommendations on economic evaluation in the field of public health. • Guidelines and recommendation on the collection and analysis of cost data. • Scientific studies (reports) comprising an economic evaluation of HIV/STI prevention intervention(s).
Analysis	• Guidelines and recommendations are analyzed qualitatively. The feasibility study will refer and summarize the relevant documents. • Scientific studies are analyzed with the scheme presented below.

General search strategy for economic evaluations of HIV/STI prevention: scientific studies and reviews	
Languages	English, German
Databases	• NHS EED National Institute for Health Research, Economic Evaluation Database, http://www.crd.york.ac.uk/CRDWeb/AboutNHSEED.asp • Web of Science (http://apps.webofknowledge.com) • ERIC Education resources information center http://www.eric.ed.gov • Campbell library http://www.campbellcollaboration.org • Cochrane library http://www.cochrane.org
Search terms (if possible, search in Title, Abstract and Key Words)	(HIV OR HIV/AIDS OR AIDS OR HIV/STI OR STI OR HIV/STD OR STD) AND prevent* AND (cost* OR spend*) AND (effective* OR consequence* OR utilit* OR benefit* OR efficiency Or (economic AND evaluation))
Search Period	01/01/1996 – today (1996 because of the introduction of ART)
Other sources	Studies found by other sources (e.g. bibliographies of systematic reviews, or of identified studies) are also taken into account.
Type of documents	• Scientific studies • Reviews
Inclusion criteria	It is an economic evaluation (CEA, CCA, CUA or CBA) of one or more prevention measure(s) or a review of economic evaluation in the field of HIV/STI.

Detailed search strategy and results			
	NHS EED – National Health Service Economic Evaluation Database	**WoK –Web of Knowledge**	**ERIC – Education Resources Information Center**
Search string	(HIV OR HIV/AIDS OR AIDS OR HIV/STI OR STI OR HIV/STD OR STD) AND prevent* AND (cost* OR spend*) AND (effective* OR consequence* OR utilit* OR benefit* OR efficiency Or (economic AND evaluation))	Titel = ((cost* OR spend*) OR (effective* OR consequence* OR utilit* OR benefit*OR efficiency) OR (economic and evaluation)) AND Topic = (HIV OR HIV/AIDS OR AIDS OR HIV/STI OR STI OR HIV/STD OR STD) AND Topic= (prevent*) AND Topic= (effective* OR consequence* OR utilit* OR benefit* OR efficiency) AND Topic= (cost* OR spend*)	(HIV OR HIV/AIDS OR AIDS OR HIV/STI OR STI OR HIV/STD OR STD) AND prevent* AND (cost* OR spend*) AND (effective* OR consequence* OR utilit* OR benefit* OR efficiency Or (economic AND evaluation))
Search for	"any field"	Title, Topic (see string)	"Keywords (all fields)"
Publication Date	01/01/1996 - 02/10/2012	1996 - 2012	1996-2012
Type of documents	any	Article or review or book or other	any
Number of results	456	671	29
Number of results included (preliminary). Results are overlapping (same studies are found in more than one database)	100	146	8 (access to 7)
Adjusted number of included studies	108		

11.3 Bibliography of the included literature from international organisations

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Organisation for Economic Co-operation and Development (OECD) (2008): The Prevention of Lifestyle-related chronic diseases: an economic framework. (http://www.oecd.org/els/healthpoliciesanddata/40324263.pdf [6.11.12])

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11.4 Consequence measures discussed in the literature of International Organisations

Main consequence measures discussed in the literature of International Organisations		
Outcome measure	**Strengths**	**Weaknesses**
Quality-Adjusted Life Years (QALY)	• Captures changes in morbidity as well as mortality • This allows direct comparison across a variety of interventions. • Quantity and quality effects combined in one measure	• Quality of life estimates for diseases in young children are virtually non-existent and the appropriate methodology for doing this is subject to debate • Can take many different forms, depending on the methods used to estimate the weights
Disability-adjusted life years (DALY) gained	• Cross-sector, -programme and -intervention comparisons are possible. • Morbidity and mortality effects combined in one measure. •Can include indirect consequences such as cases treated and/ or prevented. • Ability to assess impact of combined clinical management and prevention strategies.	• Based on subjective measures of disability. • Calculations differs from study to study • Derived from and dependent on the primary outcome of the intervention. • Debate over their validity.
Infections averted	• Comparisons across different prevention strategies are possible. • DALY can be derived easily with adequate information on mortality and life expectancy.	• Unless measured through randomized controlled trials, may need sophisticated modelling to assess impact on general population. • May not include indirect consequences of intervention.
Healthy-Years Equivalents (HYEs)	• values lifetime health paths instead of individual health states. At least in theory, it can capture more accurately the true preferences of individuals. (World Bank 2004: 11)	• Very challenging to execute
Sources: UNAIDS 1998, 2000b; World Bank 2004; authors' editing.		

Other consequence measures discussed in the literature of International Organisations		
Outcome measure	**Strengths**	**Weaknesses**
Condoms distributed or sold numbers receiving educational material numbers tested/screened …	• Ease of collection, these measures are often part of routine monitoring of programmes. • Reflects operational efficiency of programme. • Can identify most efficient method of delivery.	• No measure of impact on HIV transmission. • Does not account for variations in populations' HIV seroprevalence. • Gain achieved may not reflect real change in impact.
Numbers educated or counselled cases detected (through screening and counselling)	• same as above plus • may give some indication of impact, even though final health status unknown.	
Sources: UNAIDS 1998, 2000b; World Bank 2004; authors' editing.		

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11.6 Codebook of the literature analysis

1st level		
Formale Kategorien		**Variable**
Author	*Last Name of 1st author*	Author
Year of Publication (YoP)	Format: *YYYY* (auch: *YYYYa)*	YoP
Country of affiliated institution (1st author)	Shortcut English (eg: Germany = GER, France = FRA, USA, CH, Australia = AUS, New Zealand = NZ, ….)	Country_author
Focus of the Study		**Variable**
General focus	1 HIV 2 STIs in general (or two or more) 3 HIV and STI (if only one STI => GenFocSTI) 4 specific STI (=> GenFocSTI) 5 other 0 no information/unknown/not identifiable 99 unclear to coder	GenFoc
Focussed STI	*If GenFoc=(3 or) 4 , enter name of STI here.*	GenFocSTI
Target groups	1 General public (see also variables "GenPop_rec" = General population + patients; "GenPop_incl_young" = Gen. pop + patients + young people;)	
	2 MSM (also former 12: young MSM and "MSM inmates")	
	3 FSW	
	4 MSW	
	5 HIV positive people (see also variable "InfectedP_Part" = infected people and partners)	
	6 migrants	
	7 Young people	
	8 Injecting drug users	
	9 Men	
	10 Prisoners, inmates, ..	
	11 Pregnant women	
	~~12 Young MSM~~ (=2)	
	13 women	
	14 mentally ill	
	15 [formerly "patients". Moved (not recoded) into "GenPop_rec" and "GenPop_incl_young"]	
	16 clients of FSW/MSW	
	17 high-risk groups (if not specifically defined)	
	18 ethnically defined groups (eg. African Americans)	
	19 health care workers	
	20 partners of HIV positive people (see also variable "InfectedP_Part" = infected people and partners)	
	90 other	
	Create new for every new type of TG	
Target groups recoded	General population + patients	GenPop_rec
	Gen. pop + patients + young people	GenPop_incl_young
	infected people and partners	InfectedP_Part
Type of interventions	1 Counselling / education / information (individual and/or group), also other not more specifically defined behavioural interventions	intv
	2 Partner notification	
	3 male circumcision	
	4 Voluntary Counselling and Testing (VCT)	

	5 Street outreach		
	6 Community mobilization/outreach		
	7 Condom availability / distribution (also female condom)		
	8 Needle/syringe exchange/harm reduction/supervised injection facilities/treatment of addiction		
	9 Mass media campaign		
	10 School-based education. Other youth oriented projects (if not more specifically defined)		
	11 Screening and/or Testing (eg universal, school-based, at clinics, EDs, ..))		
	12 Screening and/or Testing of pregnant women		
	13 peer counselling/education/outreach (eg also opinion leader)		
	14 HIV treatment		
	15 MTCT prevention		
	16 STI treatment		
	90 other (describe in INTV_string)		
	Create new for every new type of intv.		
Focus of the Study			**Variable**
Country / Region of evaluation	1 Western Europe / North America / Australia, NZ 2 Eastern Europe 3 Africa 4 Latin America 5 Asia 6 international 7 other (eg >1 region. Specify in "Country Name") 0 no information/unknown/not identifiable 99 unclear to coder		CountryRegion
	Country Name	string	CountryName
Period of data collection	Start Year of data collection	YYYY	Period_data_coll_start
	End Year of data collection	YYYY	Period_data_coll_end
Time perspective	1 retrospective 2 prospective 3 other 0 no information/unknown/not identifiable 99 unclear to coder		Time_persp
Basis of comparison / of economic assessment	1 on/off (also if >1 intv but as programme/mix/a whole. Also reviews) 2 one type in diff. variations 3 more than one type 4 (prevention interventions ⇔) treatment 5 other 0 no information/unknown/not identifiable 99 unclear to coder		Basis_comparison
Study design (to measure the effect/causality)	Before/after measurements	0 no / 1 yes	studes_befaft
	Control and experimental group	0 no / 1 yes	studes_contrexp
	Randomized procedure	0 no / 1 yes	studes_random
	Review	0 no / 1 yes	studes_review
Consequences			**Variable**
Measurement of the effects	1 infections prevented (HIV, STI)		effect (1, 2, 3, 4, ..)
	2 decrease in risk behaviour		
	3 increase in prevention knowledge		
	4 DALYs gained		
	5 QALYs gained		
	6 Life years gained (LYG)		
	7 Secondary infections averted		
	8 Averted costs of (future) treatment		
	9 deaths averted		
	10 STI case treated		
	90 other		
	Create new for every new type of effect		
***:** 0 no information/unknown/not identifiable ; 99 unclear to coder			

2nd level				
Additional formal categories				**Variable**
Main question/objective/aim of study		string		mainquest
Time frame/period of study (not data)		Start Year YYYY		Study_tf_start
		End Year YYYY		Study_tf_end
Type of economic evaluation (as named by study)		1 CEA 2 CCA 3 CUA 4 CBA 90 other 91 none mentioned		Type_econeval
Costs				
Perspective (regarding type of costs collected)	1 (health) provider (omits costs incurred by private consumers) 2 societal (costs related to the strategy that are incurred by all members of society, including the private sector, the public sector and private consumers) 3 public (excludes both the private sector and the private consumers and includes only costs incurred by the public sector in implementing the strategy) 4 private sector and/or consumers (costs incurred by private sector and/or private consumers (eg participants) only) 90 other (-> string) 91 none mentioned			Perspective_costs
Direct	Are direct costs listed/explicitly named?	0 no 1 yes 2 no, but discussed		Direct_costs
Indirect	Are indirect costs listed/explicitly named?			Indirect_costs
Intangible	Are intangible costs listed/explicitly named?			Intangible_costs
Intv costs overall	Are the total costs of the intervention(s) named? (if no, study shouldn't be included). Also valid for: eg costs of one HIV test/one person counselled / "one unit of intervention"	1 yes, and more details 2 yes, but no more details		costs_overall
Type of costs	Personnel costs (if overall only or personnel-related, detailed (such as: Salaries, travel, recruitment, training, food, quality assurance, …))		0 no 1 yes	Personnel_cost
	Material/equipment costs			Material_cost
	Travel/transportation			Travel_cost
	Overhead (eg rent, facilities, vehicles, administration, IT, telephone, …)			Overhead_cost
	Other (eg start-up activities, child care (for participants), other nonparticipant costs, ...)			Other_cost
	Participants (Code every expenditure named, even if no numbers)	Participant costs (if overall and/or detailed, also families, relatives, ..)		Part_overall
		Recruitment		Part_recr
		Food		Part_food
		Monetary incentives		Part_money
		Travel, transportation		Part_travel
		Create new variable for other common expenditures		
	Volunteers (Code every expenditure	volunteer costs (if overall and/or detailed)	0 no 1 yes	Volunt_overall
		Recruitment		Volunt_recr
		Food		Volunt_food
		incentives		Volunt_incentives
		Travel, transportation		Volunt_travel
Data collection method(s): costs	1 Primary data 2 Secondary data 3 both			cost_data_collect
	Participant (time) costs. Methods? What kind (source) of data (eg budget data,)?	string		part_data_source
	Volunteers (time) costs. Methods? What kind (source) of data (eg budget data,)?	string		Volunt_data_source
	Other costs (eg personnel), also indicators/parameters used, …	String		Other_cost_source
Time frame*	..to which cost data refer: Start Year	YYYY		cost_tf_start
	..to which cost data refer: End Year	YYYY		cost_tf_end
Discounting rate*	x% (if no discounting: 98)	[number]		Cost_discounting
Estimations	Have the costs been estimated (eg based on other data)?	0 no 1 yes		Cost_estimations
Modelling	Have the costs been modelled (eg based on other data)?	0 no 1 dynamisch 2 nicht dynamisch 3 yes, other		cost_modelling
***:** 0 no information/unknown/not identifiable ; 99 unclear to coder				

consequences			Variable
Monetarisierung	Treatment costs	0 no 1 yes	Treatcost_monet
	QALY		QALY_monet
	DALY		DALY_monet
	WTP		WTP_monet
	Mortality/morbidity		Mortmorb_monet
	Productivity gains		Prodgain_monet
Monetarisierung Details	'how'? (eg mit welchem Wert? Woher stammt dieser Wert?)	string	Monet_how
Data collection method(s): effects	1 Primary data 2 Secondary data 3 both		Eff_Data_collect
	source of secondary data? (Wie erhoben? Inzidenz-/ Prävalenzdaten?)	string	Eff_Data_source
Time frame*	..to which effect data refer: Start Year	YYYY	eff_data_tf_start
	..to which effect data refer: End Year	YYYY	eff_data_tf_end
Time period / duration of effects	No time frame, but period/horizon (see prospective studies)		Eff_data_tp
Discounting Rate*	x% (if no discounting: 98)		eff_discounting
Estimations	0 no / 1 yes		eff_estimations
Modelling	Have the effects been modelled (eg based on other data)?	0 no 1 dynamisch 2 nicht dynamisch 3 yes, other / unclear	eff_modelling
Sensitivity Analysis	Performed?	0 no / 1 yes	Sens_anal
	Approach used / range (eg of re base case /factors)	string	Sens_anal_approach
Limitations mentioned re…	Costs	string	cost_limit
	Effects	string	Eff_limit
	general	string	General_limit
*: 0 no information/unknown/not identifiable ; 99 unclear to coder			

11.7 Studies included in the in-depth analysis, by axes

Full references can be found in the bibliography of the 1st level analysis.

Axis 1: Chesson (2006), Cohen et al. (2004, 2005), Farnham et al. (2012), Gillespie et al. (2012), Holtgrave/Kelly (1997), Holtgrave et al. (2012), Long et al. (2010), Mehta et al. (2002), Prabhu et al. (2011), Sanders et al. (2005), Varghese et al. (1999), Wang et al. (2000, 2002), Yazdanpanah et al. (2010).

Axis 2: Anderson et al. (2009), Cohen et al. (2004, 2005), Heumann et al. (2001), Holtgrave (2002), Juusola et al. (2011), Kahn et al. (2001), Long et al. (2010), Pinkerton et al. (1997, 1998), Pinkerton/Holtgrave (2000a), Prabhu et al. (2011), Sanders et al. (2005), Tao et al. (1998), Tuli et al. (2009), Yazdanpanah et al. (2010).

Axis 3: Cohen et al. (2004, 2005), Lee et al. (2005), Marseille et al. (2011), Varghese et al. (1999).

11.8 Data availability for the calculation of the social cost of HIV/STI

Table is displayed on the following page.

Table 20: Data availability for the calculation of the social cost of HIV/STI (excluding intangible costs)

	Data need	Data availability	Remarks
Affected population	Data on the lifetime treatment HIV Data on the treatment of other STI (complications, etc.)	SHCS data Forthcoming estimation by P. Vernazza **Missing / incomplete data:** Data on STI treatment	SHCS covers only HIV; representativeness is unclear (75% of HIV patients in ART)
Treatment costs	Inpatient care Frequency and duration of inpatient care, average value per case – Hospital care – Institutional psycho-social care	SHCS data FSO Swiss hospitalisation statistics, (diagnoses, DRG / APDRG); Swiss institutional psycho-social care statistic, FOPH act-info statistic of addiction assistance Zurn et al. 2001 **Missing / incomplete data:** Institutional psycho-social care (estimation by Zurn et al. 2001).	Delimitation of HIV/STI related health problems from other health problems.
	Outpatient care: Service frequency and duration of outpatient care, average value per case – Ambulatory medical visits HIV/STI – Psychotherapy; psychological problems related to HIV – Home care HIV	SHCS data (Laboratory analyses, no data on medical visits) FSO costs for home care in general, not related to HIV Data of the health insurances (Data Warehouse CSS Group, santésuisse data pool, IMS) Auerbach/Früh 2012 Zurn 2001 **Missing / incomplete data:** Data for home care Data for psychotherapy (Zurn et al. 2001)	Delimitation of HIV/STI related health problems from other health problems
	Drugs (Antiretroviral drugs, co-morbidity drugs, co-mediation, drugs to treat other STI)	SHCS data (AR drugs, few other drugs) FSO Swiss hospitalisation statistics Drug sales/consumptions (e.g. Data Warehouse CSS Group, santésuisse data pool, IMS) Auerbach/Früh 2012, Zurn 2001.	
Morbidity costs	Disability to work duration – Average working absenteeism per case, (frequency of permanent/temporal and full/partial disabilities) – Voluntary work and informal care per case (average time per case)	SHCS data on working rate / income sources. FSO Swiss labour force survey, disability insurance statistics; Monetary assessment of voluntary work by the SFSO. **Missing / incomplete data**: Absenteeism Voluntary work and informal care per case (average time per case)	SHCS covers HIV; representativeness is unclear
Mortality costs	premature death	SHCS data and analysis of life expectations of HIV patients FSO statistics of causes of death, including the number of lost life years.	Completeness of SFOS causes of death statistics is disputed SHCS covers mainly HIV; representativeness is unclear

11.9 List of interviewees

Name	Affiliation	Date	Interview conducted by
Urs Brügger	Zürcher Hochschule für Angewandte Wissenschaften, Winterthurer Institut für Gesundheitsökonomie (WIG)	11.12.2012	K. Frey C. Goodman
Rolf Iten	Infras, Zürich	28.2.2013	K. Frey
Sonia Pellegrini	Obsan, Neuchâtel	14.12.2012	K. Frey C. Goodman
Matthias Schwenkglenks	Institut für Sozial- und Präventivmedizin Universität Zürich	3.12.2012	K. Frey C. Goodman
Harry Telser	Polynomics, Olten	19.12.2012	K. Frey

11.10 Interview guideline

Interviews were conducted in German. Below you find the interview guideline in its original language.

Leitfaden Experteninterviews

Einleitung:

Im Auftrag des Bundesamtes für Gesundheit (BAG) führen wir eine Vorstudie durch, in der wir die Machbarkeit einer ökonomischen Evaluation der HIV/STI-Prävention in der Schweiz analysieren. Diese Vorstudie soll Diskussionsgrundlagen zur Konzeption einer realisierbaren ökonomischen Evaluation zur HIV/STI-Prävention bereitstellen.

Im Rahmen der Vorstudie analysieren wir die internationale Literatur im Bereich der ökonomischen Evaluation zur HIV/STI-Prävention. Um den spezifischen Kontext der Schweiz zu berücksichtigen, führen wir Interviews mit Expertinnen und Experten der ökonomischen Evaluation im Gesundheitsbereich durch. Schliesslich umfasst diese Vorstudie auch eine Pilotstudie, so werden wir die Kosten (Input-Seite) für eine Präventionsmassnahme im Kanton Zürich erheben (Mission possible).

Im folgenden Gespräch möchten wir ihre Expertenmeinung zu einer ökonomischen Evaluation im Bereich der HIV/STI-Prävention abholen. Das Gespräch gliedert sich wie folgt:

- Möglichkeiten einer ökonomischen Evaluation im Bereich HIV/STI-Prävention allgemein
- Vorstellung des BAG über die ökonomische Evaluation der HIV/STI-Prävention
- Ausgestaltung einer ökonomischen Evaluation der HIV/STI-Prävention

1. Möglichkeiten einer ökonomischen Evaluation im Bereich HIV/STI-Prävention

- Was sind die Möglichkeiten und Grenzen einer ökonomischen Evaluation im Bereich HIV/STI-Prävention? Beurteilung?

Die ökonomische Evaluation kennt unterschiedliche Typen von Analysen. Meist wird zwischen Kosten-Wirksamkeits-Analysen (cost-effectiveness/-consequences), Kosten-Nutzwert-Analysen (cost-utility) und Kosten-Nutzen-Analysen (cost-benefit) unterschieden.

- Wie beurteilen sie die Aussagekraft, Machbarkeit und Nutzen dieser Analysetypen (auch in Bezug auf allfällige Schwierigkeiten und Grenzen)?

2. Beurteilung der BAG-Vorstellungen für eine ökonomische Evaluation im Bereich der Prävention von HIV und STI

Gemäss BAG soll die ökonomische Evaluation eine gesellschaftliche Perspektive einnehmen. Das Kosten-Nutzen-Verhältnis der HIV/STI-Prävention in der Schweiz soll insgesamt analysiert werden, aber auch das Kosten-Nutzen-Verhältnis der einzelnen Interventionsachsen des neuen nationalen Programms aufzeigen (1: Gesamtbevölkerung; Interventionsachse 2: Personen mit einem erhöhten Expositionsrisiko; Interventionsachse 3: Infizierte Personen und deren Partnerinnen und Partner.).

- Wie beurteilen Sie die Aussagekraft und Nutzen (Nutzung für die Politikformulierung) eines solchen Vorhabens? Grenzen?
- Wie beurteilen Sie die Machbarkeit eines solchen Vorhabens? Schwierigkeiten

Diese Analyse soll einerseits alle Kosten (Input) berücksichtigen, andererseits auch für die BAG-Präventionsanstrengungen (BAG-Ressourcen) separat durchgeführt werden.

- Wie beurteilen Sie die Aussagekraft und Nutzen (Nutzung für die Politikformulierung) einer solchen Unterscheidung? Grenzen?
- Wie beurteilen Sie die Machbarkeit einer solchen Unterscheidung? Schwierigkeiten

Das BAG interessiert sich zudem für die optimale Verteilung der Präventionsmassnahmen (Ressourcen) auf die drei Interventionsachsen des NPHS: Welcher Mix produziert das beste Kosten-Nutzen-Verhältnis?

- Wie beurteilen Sie die Aussagekraft und Nutzen (Nutzung für die Politikformulierung) einer solchen Analyse? Grenzen?
- Wie beurteilen Sie die Machbarkeit einer solchen Analyse? Schwierigkeiten

Das BAG interessiert sich schliesslich speziell für das Kosten-Nutzen-Verhältnis der Zürcher Präventionsmassnahmen für Männer, die Sex mit Männern haben (MSM).

- Wie beurteilen Sie die Aussagekraft und Nutzen (Nutzung für die Politikformulierung) einer solchen Analyse? Grenzen?
- Wie beurteilen Sie die Machbarkeit einer solchen Analyse? Schwierigkeiten

Welche Perspektiven/Anliegen sollten Ihrer Meinung nach Priorität geniessen? Begründung?

3. Ausgestaltung einer ökonomischen Evaluation der HIV/STI-Prävention

Fragen zur Konzeption und Messung der Kosten (Input / Ressourceneinsatz)

- Welches sind die Kostenarten, die bei einer ökonomischen Evaluation von HIV/STI-Präventionsmassnahmen auf der Input-Seite (zwingend) berücksichtigt werden sollten?
- Welche Möglichkeiten sehen sie zur Erhebung der Kosten (Ressourceneinsatze) der HIV/STI-Prävention in der Schweiz? (Voll/Teilerhebung, Datenquellen, Schwierigkeiten).

Fragen zur Konzeption und Messung der Konsequenzen der HIV/STI-Prävention

- Welche Wirkungen und Nutzen der HIV/STI-Präventionsmassnahmen sollten in einer ökonomische Evaluation (zwingend) berücksichtigt werden?
- Welche Ansätze zur Identifikation/Bewertung des Nutzen (Nutzwerte) eigenen sich für eine ökonomische Evaluation von HIV/STI-Präventionsmassnahmen?
- Welche Möglichkeiten sehen sie zur Erhebung der Konsequenzen der HIV/STI-Prävention in der Schweiz? (Schwierigkeiten, Kausalitäten, Datenquellen, usw.)

Ökonomische Evaluationen können unterschiedliche **Zeitperspektiven** einnehmen, d.h. retro- oder prospektive Aussagen generieren:

- Welche Möglichkeiten sehen sie in Bezug auf die Zeitperspektive einer ökonomischen Evaluation von HIV/STI-Präventionsmassnahmen der Schweiz?
  - Retro- oder prospektiv? Begründung? (Aussagekraft, Machbarkeit, Nutzen für die Politikformulierung)
  - Angemessen Zeitperiode? Begründung?

Diskontierung und Sensivitätsanalysen

- Zu Beginn des Gesprächs haben wir über den Zeithorizont einer ökonomischen Evaluation gesprochen. Wie beurteilen sie die Frage der Diskontierung der Kosten im Rahmen einer ökonomischen Evaluation von HIV/SIT-Präventionsmassnahmen?
- Welches sind die Möglichkeiten von Sensivitätsanalysen im Rahmen einer ökonomischen Evaluation der HIV/SIT-Prävention? (zwingende Parameter/Faktoren, Ansatz, Range)

4. Weiterführende Hinweise

- Gibt es (bedeutsame) Aspekte einer ökonomischen Evaluation der HIV/STI-Prävention, die wir im Rahmen dieses Gesprächs noch nicht angesprochen haben?

- Gibt es eine ökonomische Evaluation im Präventionsbereich, die sie uns als gutes Beispiel empfehlen möchten?
- Weitere mögliche Gesprächspartner/-innen: Welche Expertin oder welcher Experte könnte uns weitere wertvolle Hinweise zu den Möglichkeiten einer ökonomischen Evaluation der HIV/SIT-Prävention liefern?